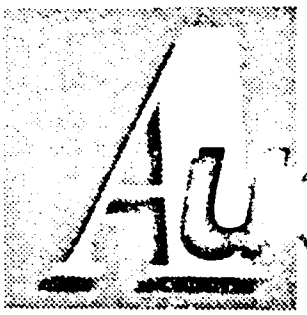

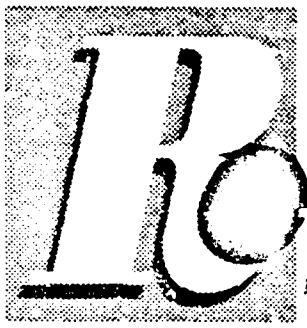

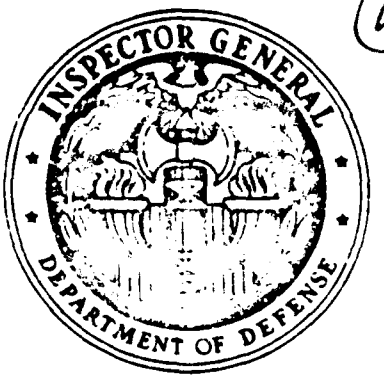

OFFICE OF THE INSPECTOR GENERAL

DOD PARTICIPATION IN NORTH ATLANTIC TREATY ORGANIZATON TACTICAL COMMAND, CONTROL, AND COMMUNICATIONS INTEROPERABILITY

Report Number 93-015

November 3, 1992

Department of Defense

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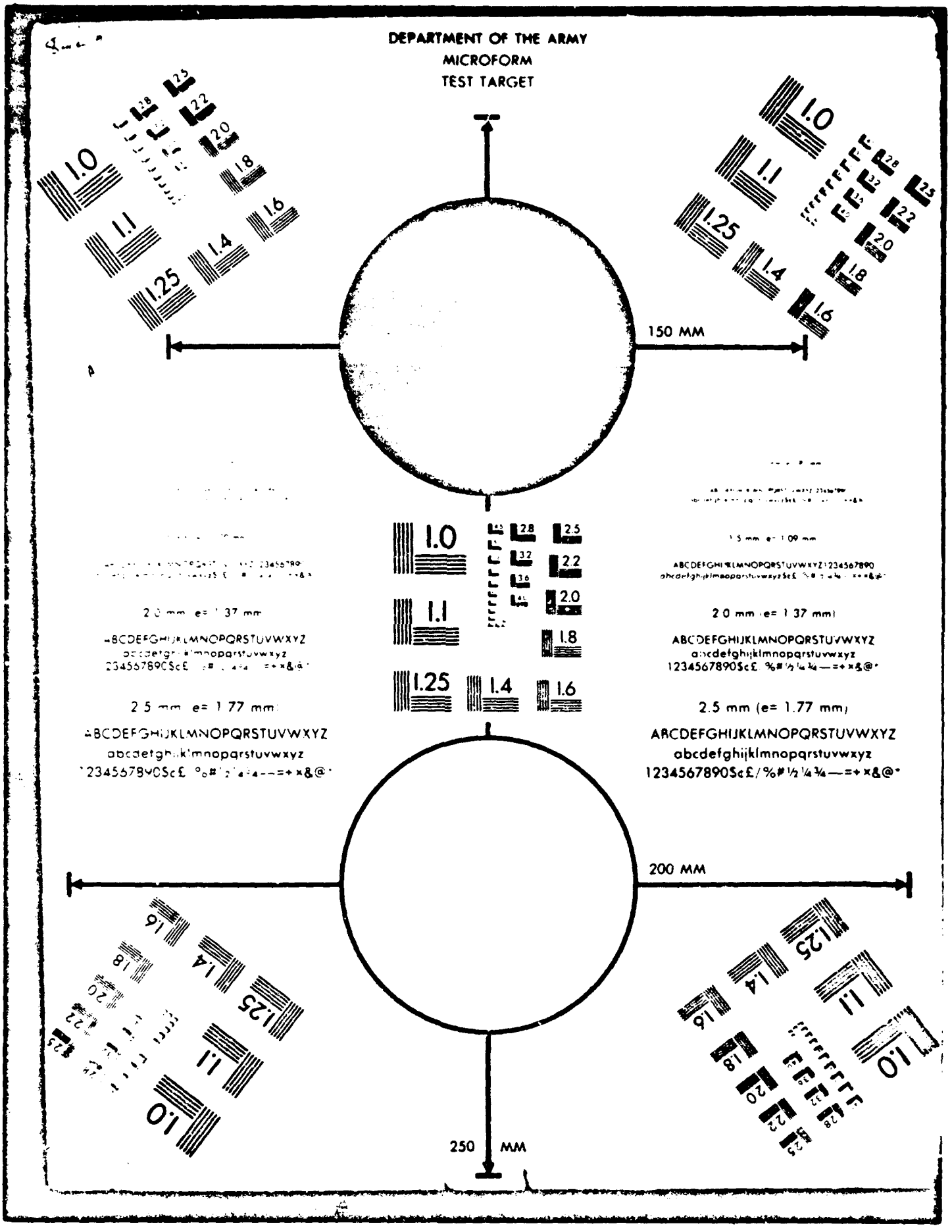
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The following acronyms are used in this report.

AB.....Air Base
ACCS.....Air Command and Control System
AFB.....Air Force Base
ASD(C3I).....Assistant Secretary of Defense (Command, Control, Communications and Intelligence)
C3.....Command, Control, and Communications
C3I.....Command, Control, Communications and Intelligence
DISA.....Defense Information Systems Agency
EUCOM.....U.S. European Command
FM.....Field Manual
FMFM.....Fleet Marine Field Manual
JIEO.....Joint Interoperability and Engineering Organization
JITC.....Joint Interoperability Test Center
MOP.....Memorandum of Policy
NATO.....North Atlantic Treaty Organization
OPLANS.....Operational Plans
SAM.....Surface-to-Air-Missile
SHAPE.....Supreme Headquarters, Allied Powers, Europe
STANAG.....Standardization Agreement
TADIL.....Tactical Digital Information Link
TOE.....Table of Organization and Equipment

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-2884

November 3, 1992

MEMORANDUM FOR ASSISTANT SECRETARY OF DEFENSE (COMMAND, CONTROL, COMMUNICATIONS AND INTELLIGENCE)
COMMANDER IN CHIEF, U.S. EUROPEAN COMMAND
ASSISTANT SECRETARY OF THE NAVY (FINANCIAL MANAGEMENT)
ASSISTANT SECRETARY OF THE AIR FORCE (FINANCIAL MANAGEMENT AND COMPTROLLER)
INSPECTOR GENERAL, DEPARTMENT OF THE ARMY
DIRECTOR, DEFENSE INFORMATION SYSTEMS AGENCY
DIRECTOR, JOINT STAFF

SUBJECT: Audit Report on DoD Participation in North Atlantic Treaty Organization Tactical Command, Control, and Communications Interoperability (Report No. 93-015)

This is one of two reports issued as part of our overall audit of U.S. interoperability with North Atlantic Treaty Organization (NATO) tactical command, control, and communications. It is provided for your review and comments and addresses DoD's commitment to the NATO Command and Control System, implementation of Standardization Agreement 2101, and testing of tactical command, control, and communications systems with the Supreme Headquarters, Allied Powers, Europe, Technical Center. The other report was issued on August 25, 1992, as a draft (Project No. 1RA-0048.01) and addresses the lack of combined (U.S. and Allied forces) doctrine, tactics, techniques, and procedures; the effectiveness of the Interoperability Improvement Program; and the DoD's management of tactical C3 architectures.

A draft of this report was provided to the addressees for comment on June 30, 1992. Replies were received from the Assistant Secretary of Defense (Command, Control, Communications and Intelligence), the U.S. European Command, and the Defense Information Systems Agency on August 27, 1992; and from the Joint Staff on August 31, 1992. Replies were not received from the Departments of the Army and the Navy as of October 16, 1992.

DoD Directive 7650.3 requires that all audit recommendations be resolved promptly. The Status of Recommendations sections provided at the end of each finding identify the unresolved recommendations and the specific requirements to be addressed in your comments on this final report. Recommendations are subject

to resolution in accordance with DoD Directive 7650.3 in the event of nonconcurrence or failure to comment. Your comments are requested within 60 days of the date of this report.

The courtesies extended to the audit staff are appreciated. If you have any questions on this audit, please contact Mr. John A. Gannon on (703) 692-2906 (DSN 222-2906) or Ms. Evelyn R. Klemstine on (703) 692-2831 (DSN 222-2831). The distribution of this report is listed in Appendix G.

Robert J. Lieberman
Assistant Inspector General
for Auditing

cc:
Secretary of the Army
Secretary of the Navy
Secretary of the Air Force
Commandant of the Marine Corps

Office of the Inspector General, DoD

AUDIT REPORT NO. 93-015 **November 3, 1992**
(PROJECT NO. 1RA-0048)

DOD PARTICIPATION IN NORTH ATLANTIC TREATY ORGANIZATION TACTICAL COMMAND, CONTROL, AND COMMUNICATIONS INTEROPERABILITY

EXECUTIVE SUMMARY

Introduction. U.S. policy is that equipment procured for U.S. Armed Forces employed in Europe under the terms of the North Atlantic Treaty Organization (NATO) should be standardized or at least interoperable with equipment of other NATO members. The NATO Air Command and Control Systems (ACCS) Program is intended to integrate the planning, tasking, execution, and control of all NATO tactical air operations--defensive (to include Surface-to-Air Missile employment), offensive, and support. Standardization Agreement (STANAG) 2101 requires each ratifying nation to identify, equip, and train personnel as the liaison for communications.

Objectives. This segment of the overall audit of tactical command, control and communications (C3) interoperability assessed DoD's commitment to and participation in NATO interoperability programs. A second segment of the overall audit, reported separately under Project No. 1RA-0048.01, evaluated the management of tactical C3 interoperability efforts within DoD and the internal controls to ensure the achievement of maximum interoperability.

Audit results. The audit determined that combined interoperability with U.S. NATO allies is not being fully achieved. The Joint Staff has not validated a requirement for the Services' C3 systems to integrate with the NATO ACCS Program, and a joint program office has not been established to ensure that U.S. tactical C3 requirements are adequately planned for and addressed. The Army and Marine Corps doctrines, Tables of Organization and Equipment, and training do not include the STANAG 2101 liaison requirement. In addition, the U.S. European Command has not determined the communication systems necessary to implement the STANAG requirement. A C3 testbed link has not been established between the U.S. joint test facility and the NATO Supreme Headquarters, Allied Powers, Europe, Technical Center.

- The Services' tactical C3 interoperability with the NATO ACCS Program (the Program) cannot be assured unless the integration requirement is validated and U.S. operational requirements are addressed. Without effective DoD management of the Program, the U.S. may duplicate the costs of implementing the Services' C3 systems into the new NATO command and control

centers, and U.S. industry may not be afforded the opportunity to fully compete during the acquisition phase of the Program **(Finding A)**.

- The Army and Marine Corps have not implemented STANAG 2101 to ensure the C3 interoperability of land forces during combined warfare. Joint Staff Publication 5-02.2, "Joint Operation Planning System Volume II OPLAN [Operations Plan] Format and Guidance," does not require the Commanders in Chief of the Unified and Specified Commands to address the liaison requirement in their operational plans. The liaison requirement must be institutionalized by the DoD as a critical element of modern warfare to ensure command and control interoperability of multinational forces **(Finding B)**.

- The Joint Interoperability Test Center has not fully utilized its capability to test the Services' command, control, and communications systems with NATO forces. Testing the combined interoperability of these systems is essential in ensuring that efficient interfaces and interworking between U.S. and NATO systems exist **(Finding C)**.

Internal controls. Internal controls are addressed in the second segment (Project No. 1RA-0048.01) of the overall audit.

Potential benefits of audit. Implementation of the recommendations will strengthen the DoD's commitment to NATO interoperability by requiring U.S. systems to integrate with the new NATO command and control centers, institutionalizing the requirement for liaison teams during combined operations, and testing similar combined tactical C3 systems. Appendix E contains the specific benefits resulting from the audit.

Summary of recommendations. We recommended that the requirement for the Services' C3 systems to integrate with NATO ACCS be validated and that the joint program office be established for U.S. participation in the Program. Also, we recommended that guidance be issued to implement the liaison requirement and that the Army and Marine Corps incorporate the requirement into their doctrine and equip and train for the requirement. In addition, we recommended that a test link be established between the U.S. Joint Interoperability Test Center and NATO.

Management comments. The Assistant Secretary of Defense (Command, Control, Communications and Intelligence) (ASD[C3I]) partially concurred with establishing Program goals, milestones, and procedures to respond to NATO contract deliverables for the NATO ACCS. The Assistant Secretary nonconcurred with establishing a joint program office and developing an interoperability architecture for the U.S. integration into the NATO ACCS. The Commander in Chief, U.S. European Command, concurred in the recommendations addressed to the Command. Responses on the draft report were not received from the Departments of the Army and the Navy. The Director, Defense Information Systems Agency, partially concurred with establishing a test link between the

U.S. Joint Interoperability Test Center and NATO. The Director, Joint Staff, provided comments on the draft report; however, the comments did not address recommendations directed to the Joint Staff.

On August 3, 1992, after issuance of our draft report, the ASD(C3I) issued a memorandum to the Secretaries of the Military Departments; Chairman, Joint Chiefs of Staff; and the Director, Defense Information Systems Agency. The memorandum provided policy guidance, established U.S. goals, and assigned the lead Service responsibilities to the Air Force for U.S. participation in the Program. A copy of the memorandum is included in Part IV of this report. The ASD(C3I) memorandum satisfies the intent of Recommendations A.3.a. and A.3.b.; thus, no further comments are required on those recommendations. In response to Recommendation A.3.d., the ASD(C3I) sent subject matter experts to review contract deliverables to the central region Regional Programming Office which satisfies the intent of the recommendation. We requested that the ASD(C3I) reconsider his response on Recommendation A.3.c.

Details on management's comments and audit responses are in Part II of the report, and the full texts of managements' comments are in Part IV. The ASD(C3I); Commander in Chief, U.S. European Command; Departments of the Army and Navy; Director, Defense Information Systems Agency; and the Director, Joint Staff, are requested to provide comments on unresolved issues within 60 days of the date of this report.

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This report was prepared by the Readiness and Operational Support Directorate, Office of the Assistant Inspector General for Auditing, DoD. Copies of the report can be obtained from the Secondary Reports Distribution Unit, Audit Planning and Technical Support Directorate (703) 614-6303 (DSN 224-6303).

PART I - INTRODUCTION

Background

Multinational forces. In a post-Warsaw Pact environment reduced force levels and resources, nations will defend the interests in coalitions. Therefore, interoperability betwe forces and standardization of equipment and procedures wi become even more important in the future. Higher operation flexibility, mobility, and responsiveness; the ability reinforce and maneuver troops rapidly; and the need for qui reactions to changing situations will demand command and contr systems that are interoperable and flexible.

Interoperability. The North Atlantic Treaty Organizati (NATO) Allied Administrative Publication No. 610, "Glossary Terms and Definitions for Military Use," and Joi Publication 1-02, "Department of Defense Dictionary of Milita and Associated Terms," December 1989, define interoperability the ability of systems or forces to provide service to a accept services from other systems, units, or forces and to u those services to enable systems, units, or forces to operat effectively. Interoperability is achieved among communication electronics systems or equipment when information or services c be exchanged directly and satisfactorily between them or the users. The objective of NATO interoperability is to enable NA and national military commands to operate effectively together.

NATO interoperability requirements. NATO Militar Committee Requirement No. 245, "Statement of Military Requiremen for Interoperability Between Automated Data Systems," August 1976, states that automated data systems, whether NATO o nationally-owned and used by the forces of NATO, must be interoperable. The extent of interoperability between specifi systems is to be determined and agreed upon based on the information exchange requirements of cooperating forces. Th Chiefs of National Defense Staffs, who comprise the Nort Atlantic Military Committee, have stated that command, control, and information systems must be interoperable in order for military field commanders to successfully prosecute war.

U.S. interoperability requirements. United State Code, title 10, section 2457, "Standardization of Equipment wit North Atlantic Treaty Organization Members," and DoD Directive 2010.6, "Standardization and Interoperability of Weapon Systems and Equipment within the North Atlantic Treat Organization," March 5, 1980, state that it is U.S. policy that equipment procured for U.S. forces employed in Europe under the terms of NATO should be standardized or at least interoperable with equipment of other NATO member nations. Furthermore, DoD Directive 2010.6 states that the United States will ensure NATO

interoperability, especially for command, control, and information systems. DoD Directive 4630.5, "Compatibility and Interoperability of Tactical Command, Control, Communication, and Intelligence Systems," October 9, 1985, requires that the Joint Staff ensure compliance with NATO standardization agreements (STANAGs). DoD's goal is to achieve standardization and maximize the degree of interoperability throughout the NATO military force.

Tactical command, control, and communications. In NATO, C3 denotes command, control, and consultation. Within DoD, C3 denotes command, control, and communications. For the purposes of this report, C3 will denote command, control, and communications. DoD has further defined tactical C3 systems as those systems that provide the means of integrating various tactical combat elements into a focused, efficient, fighting force for conducting offensive and defensive ground, sea, and air operations. Interoperability of tactical C3 systems requires integration of surveillance and identification systems, command centers, communication systems to transmit orders, and navigation and positioning systems.

NATO Air Command and Control System (ACCS). The current NATO command and control system is a defensive system in need of massive upgrades to be effective. The intent of the NATO ACCS Program (the Program) is to integrate the planning, tasking, execution, and control of all NATO tactical air operations, thereby making the ACCS a defensive, offensive, and sustaining system. The Program will improve current command and control systems by replacing analog equipment with digital capabilities that provide a faster and more reliable transfer of data. The ACCS was conceptualized in 1983 as the largest system acquisition ever planned and programmed by NATO. The Program is sponsored and supported by 14 of the 16 NATO member nations, with an anticipated $8 billion infrastructure budget through 1998. Despite political, military, and economic changes in Europe, it is expected that NATO will remain in existence and that until it is operational, the Program will remain a requirement for the Supreme Allied Commander, Europe.

Objectives

The overall objective of the audit was to evaluate U.S. interoperability with NATO tactical C3. Also, we assessed DoD's commitment to NATO tactical C3 interoperability.

This audit was divided into two segments. This report addresses U.S. participation in the Program and the DoD's implementation of STANAG 2101 and NATO test initiatives. A separate draft report, issued August 25, 1992, addressed DoD's doctrine, tactics, techniques, and procedures for combined command, control, communications, and computers; the Interoperability Improvement Program; and management of C3 architectures.

Scope

We examined the ACCS Master Plan, the NATO Interoperability Planning Document, the minutes of the Allied Data Systems Interoperability Working Group, and other international agreements. In addition, we analyzed DoD and Service regulations, operational plans, C3 Operation Desert Storm after-action reports, and C3 testing plans. For the purposes of this report, the Services include, the Army, Navy, Air Force, and Marine Corps. We reviewed pertinent documentation dated from September 1983 to January 1992. We visited selected Army and Marine Corps combat and support units that performed the liaison function during Operation Desert Storm. Our audit did not address intelligence systems.

The audit was performed from April 1991 through March 1992 at the activities listed in Appendix F. This program audit was made in accordance with auditing standards issued by the Comptroller General of the United States as implemented by the Inspector General, DoD.

Internal Controls

Internal controls were addressed in a separate draft audit report on Management of DoD Interoperability Efforts for Tactical Command, Control, and Communications issued August 25, 1992.

Prior Audits and Other Reviews

In the past 5 years, no audits or reviews have specifically addressed U.S. interoperability with NATO tactical C3 systems.

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PART II - FINDINGS AND RECOMMENDATIONS

A. U.S. PARTICIPATION IN THE NATO ACCS PROGRAM

The Services' C3 systems interoperability requirements have not been managed in a manner to maximize the effectiveness of U.S. participation in the Program. The basic requirement for the Services' C3 systems to integrate with the NATO ACCS has not been validated. A joint program office has not been established within the DoD to ensure that U.S. tactical C3 requirements are adequately planned for and addressed in the Program. As a result, U.S. military operational requirements may not be included in the Program, and the interoperability of U.S. systems is not assured. Additionally, the United States may duplicate costs of implementing the Services' C3 systems into the new NATO command and control centers. Furthermore, U.S. industry may not be given the opportunity to fully compete in the Program's procurement process.

DISCUSSION OF DETAILS

Background

The Joint Staff is responsible for evaluating combined (U.S. and Allied forces) doctrinal, conceptual, and procedural aspects of requirements documents and for ensuring the resolution of conflicts that could result in system incompatibilities. DoD Directive 4630.5 and the Joint Staff Memorandum of Policy (MOP) 160, "Compatibility and Interoperability of Tactical Command, Control, Communications, and Intelligence Systems," January 7, 1986, assign the Joint Staff the responsibility for validating new or modified operational requirements for combined C3 systems or equipment. Joint Publication 1-02 defines an operational requirement as "an established need justifying the timely allocation of resources to achieve a capability to accomplish approved military objectives, missions, or tasks." MOP 160 also requires each Service to participate in the combined requirement validation process.

DoD Directive 5137.1, "Assistant Secretary of Defense for Command, Control, Communications, and Intelligence," February 12, 1992, requires the Assistant Secretary of Defense (Command, Control, Communications and Intelligence (ASD[C3I]) to develop policy and issue guidance for NATO C3I architectures and systems. DoD Directive 5105.19, "Defense Information Systems Agency" (DISA), June 25, 1991, requires the DISA to ensure that U.S. C3 systems are interoperable with NATO systems and other Allied C3 systems. Under the direction of the ASD(C3I), the DISA provides guidance and support to the Joint Staff, the Unified and Specified Commands, and the Services on technical and operational C3 and information systems issues affecting the ASD(C3I). In addition, the DISA is responsible for developing interoperability

architectures that are designed to aid commanders in evaluating the effectiveness of fielded C3 systems, determining if deficiencies exist that could impede interoperability, and making recommendations on how those deficiencies can be corrected.

Program Validation

The NATO Defense Ministers approved the recommended modernization of NATO air command and control systems in a report entitled, "The Refined Program for Air Defense in Allied Command Europe." As a result, in 1983, NATO member nations approved the Program to satisfy the modernization requirement. The United States and other NATO member nations agreed to participate and support the Program. However, in the 9 years since the United States joined the Program, the Joint Staff has not validated the requirement for the Services' C3 systems to integrate with the NATO ACCS.

In January 1989, the U.S. European Command (EUCOM) officials prepared and submitted the U.S. Air Command and Control System Plan (the Plan) to the Joint Staff for validation. The Plan documented EUCOM's statement of requirements for developing and modifying U.S. C3 systems to comply with the Program's architecture. In October 1989, the Joint Staff's response stated that EUCOM needed to make specific additions and changes before the Plan could be validated. The Plan has not been resubmitted for validation. EUCOM officials were unable to explain why the Plan had not been resubmitted.

Joint Requirements

The Program covers all air operations: defensive, offensive, and support, including the necessary surveillance and communications subsystems. NATO's goal for the Program is to achieve a system that provides efficient use of NATO tactical air resources under all operational conditions. The Services' participation in the Program is vital to ensure connectivity and interoperability between U.S. national systems and the NATO ACCS.

Air Force. The Air Force has been the most active Service in addressing its operational requirements for the Program. In 1986, EUCOM assigned Headquarters, U.S. Air Forces, Europe, the responsibility for planning and implementing the Program in-theater. In September 1990, the Air Force Headquarters developed and approved a statement of operational need for its participation in the Program. In January 1991, the Air Force prepared a functional analysis of selected Air Force C3 systems to assess the Program design, to identify shortfalls in the Program architecture, and to examine C3 systems capable of NATO utilization in the program. However, the results of the analysis have not been used.

Other Services. The other Services have not addressed their operational requirements. Army officials did not view the Army as a major player and believed the Program primarily addressed

Air Force requirements. An Army official stated that "the Army expected to be able to plug its C3 system equipment into a port and everything would work." Navy officials stated that the Program needed to be better defined before they would address Naval interface requirements. The Marine Corps had not been tasked by the Navy to address the Corps' operational requirements. The Army, Navy, and Marine Corps have not officially designated an office to address their operational requirements.

Army requirements. U.S. Army Air Defense Artillery units cannot communicate directly with German Surface-to-Air Missile (SAM) units operating in Central Europe. Direct communications between German and U.S. air defense units are not possible for two reasons. First, communications equipment and communications security equipment are incompatible. Second, the German HAWK battalions use a data processing language not used by the United States. Although the Program was not designed to correct interoperability deficiencies, the Program's SAM Operations Center (Operations Center) should improve the ability of command and control systems to effectively process information from all sources. To permit effective missile management, to prevent firing on friendly aircraft, and to reduce SAM unit vulnerability, communications interoperability must be achieved between the SAM Operations Centers and subordinate and adjacent SAM units and between SAM Operations Centers and the Program. In the Program's architecture, SAM Operations Centers are designed as mobile units functionally subordinate to the Air Control Center. The Air Control Center is the main mission control and battlefield management center that provides support for defensive air missions (including SAM missions) for offensive and support air missions.

An additional Army requirement is the Air Operations Coordination Center (Coordination Center). The Coordination Center is the primary link between U.S. Army Forces and the Program. The Coordination Center is designed to coordinate and direct NATO air operations with Army ground and air operations.

Naval requirements. The Navy has a critical operational requirement for maritime forces to interface with land forces. The maritime interface can be divided into two parts: the interface with Naval Headquarters ashore and the interface with Naval Headquarters afloat. The requirement is addressed in the Maritime ACCS Shore and Ship Tactical Interface Component (Interface Component). Implementation of the Interface Component will enable maritime forces to exchange current information, to coordinate air operations over the sea, and to provide tactical information between naval forces ashore and naval forces afloat. An additional Naval requirement for the Program is the Maritime Air Operation Centers (the Centers) located at Headquarters ashore and Headquarters afloat. The

primary purpose of the Centers will be to coordinate air assets and transfer surveillance information between maritime forces and the Program.

Marine Corps requirements. The Marine Corps possesses a full range of combat capabilities integrated into a single-Service, air/ground, combined arms team (e.g., artillery and armor). Many of the Marine Corps' C3 systems are purchased through other Services; however, the technical and operational deployment of the C3 systems differ. For example, the Marine Corps and the Air Force are procuring the Module Control Equipment. However, the two Services' systems differ in radar and computer software. The Marine Corps has designed its Module Control Equipment to transmit radar data to a computer system that is not collocated at the radar site. Therefore, processed data must be transmitted to a Marine Corps Tactical Air Operation Center for use. The Air Force has designed its Module Control Equipment to transmit to the existing radar computer system collocated at the Tactical Air Control Center. Regarding operational differences, the Marine Corps uses its equipment to provide coverage of a specific area in the theater of operations, whereas the Air Force uses the same equipment to provide radar coverage of the entire theater.

Program Management

The U.S. portion of the Program has lacked strong leadership and centralized direction. The ASD(C3I) has neither provided Program policy and guidance to the Joint Staff, Services, or DISA nor established a joint program office to manage the Services' requirements. The DISA has not been tasked by the ASD(C3I) to support the Program. In addition, effective procedures have not been established for DoD to respond to deliverables[1/] under the equipment and systems specifications contract for NATO ACCS.

Policy and guidance. In August 1990, the ASD(C3I) prepared a draft memorandum for the Deputy Secretary of Defense that would have established four goals for U.S. participation in the Program. The proposed goals were:

- Ensure that the U.S. portion of the Program meets the NATO military operational requirements.

- Ensure U.S. command, control, communications, and intelligence systems and weapon systems are interoperable with the NATO ACCS.

- Influence the system specifications for and implementation of the ACCS to facilitate the integration and interoperability of U.S. systems within the ACCS architecture.

1/ Documents describing system specification requirements for the NATO ACCS.

- Ensure that U.S. industry is afforded equal opportunity to compete during the Program's implementation.

Had the Deputy Secretary of Defense signed the memorandum, the Air Force would have been delegated the authority to direct and coordinate the Services' participation in the Program. As of the time of the audit, the ASD(C3I) had not forwarded the memorandum to the Deputy Secretary of Defense for signature.

Air Force lead. In considering the role as lead Service for the Program, the Air Force had three areas of concern. First, the Air Force requested to be the U.S. representative on the Program's Board of Directors, when the Program reached the acquisition phase. Second, the Air Force was concerned about its ability to fund the management of its lead Service responsibilities. Third, the Air Force wanted the Army and Navy to be more active in the Program. In October 1991, the ASD(C3I) concurred with the Air Force request for representation on the Program's Board of Directors and stated that ASD(C3I) officials would work with the Air Force to identify costs and allocate funds for the Program if the need arose. The ASD(C3I) also stated that the Army and Navy would be formally tasked to support the activities of the Air Force, as lead Service, and to identify a point of contact for Program participation. As of the time of our audit, the Air Force had not been officially designated as the lead Service, and the Army and Navy had not been tasked to participate in the Program. Joint Service participation is vital to ensuring that U.S. C3 systems are interoperable with the NATO ACCS.

Architecture. The ASD(C3I) has not tasked the DISA to prepare a multi-Service architecture to determine the Services' tactical C3 systems' ability to interface with the NATO ACCS. MOP 160 states that the basis for achieving compatibility and interoperability among tactical C3 systems will be through joint architectures. An architecture must be developed to determine the ability of U.S. systems to perform the Program's mission. In addition, the architecture would provide the DoD with an assessment of compatibility and interoperability shortfalls that exist between current and planned U.S. C3 systems and the ACCS.

ACCS contract deliverables. The DoD did not respond to NATO on the Program's operational requirements document. The requirements document is the first of 17 deliverables under the specifications contract and lays the foundation for the Program. DoD involvement in the development of the Program's operational requirements and specifications is crucial to ensure that the completed Program meets NATO and U.S. needs and that U.S. systems are integrated into the Program.

Future deliverables. NATO is scheduled to receive the next two deliverables, the Draft System Logical Model and the Draft Overall System Specification documents in May 1992. A logical model defines the decision-making process necessary to

meet the system specifications. Once those specifications are received by NATO, member nations will have 2 weeks to review the documents and provide initial comments. Final comments are due to NATO 5 weeks after receiving the deliverable. For example, the logical models for the SAM Operations Center and Maritime ACCS Shore and Ship Tactical Interface Component are scheduled for delivery to NATO member nations in November 1992. Upon receipt of those deliverables, the United States will have only 5 weeks to respond. Without the establishment of procedures to respond to future deliverables, the United States cannot be assured that integration and interoperability of the Services' tactical C3 systems are fully considered in the Program's architecture and specifications. Appendix A contains a schedule of 16 future deliverables under the specifications contract.

Duplicate costs. Ineffective management and non-response to future Program deliverables may cause the United States to expend twice the funds necessary to achieve operational connectivity with the Program. As the largest contributor to NATO, the United States annually pays 28 percent of the NATO infrastructure budget. Over an 8-year period, the Program is expected to cost approximately $8 billion of which the United States would contribute $2 billion. The United States could unnecessarily pay to build gateways (would provide connectivity to the NATO systems) so that U.S. tactical C3 systems interfacing at the Air Force wing level[2/] and below will be able to interoperate with the ACCS.

Industrial base. DoD's inability to respond to deliverables may also deny U.S. industry the ability to fully compete during the Program's acquisition phase. As stated earlier, one of DoD's proposed goals for the Program is to ensure that U.S. industry will be able to compete against other NATO nations for contracts during the Program's acquisition phase. Without U.S. involvement early in the requirements and specification determination phases of the Program, U.S. industry may find difficulties competing against other member nations that participated in determining the Program's requirements.

RECOMMENDATIONS, MANAGEMENT COMMENTS, AND AUDIT RESPONSES

1 We recommend that the Commander in Chief, U.S. European Command, resubmit the U.S. Air Command and Control System Plan to the Joint Staff for validation.

Management comments. The Commander in Chief, U.S. European Command, concurred with the recommendation and stated that EUCOM will resubmit the U.S. Air Command and Control System Plan to the

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2/ An Air Force unit composed normally of one primary mission group and the necessary supporting organization.

Joint Staff for validation once those issues that resulted in the Joint Staff returning the Plan in October 1989 have been resolved. We request that the anticipated date for resubmittal of the Plan be provided in response to this final report.

2. We recommend that the Director, Joint Staff, validate the U.S. Air Command and Control System Plan.

Management comments. The Director, Joint Staff, stated that the Joint Staff will initiate action to validate the U.S. Air Command and Control Plan once the plan is received from EUCOM.

Audit response. The Director's reply meets the intent of the recommendation. Final comments are requested to provide an estimated timeframe for completion of validation once the Plan is resubmitted.

3. We recommend that the Assistant Secretary of Defense (Command, Control, Communications and Intelligence):

a. Establish milestones and program goals for the Services' implementation of the NATO Air Command and Control System.

b. Designate a joint program office to manage the U.S. portion of the NATO Air Command and Control System Program.

c. Require the Defense Information Systems Agency to prepare an interoperability architecture for the U.S. segment of the NATO Air Command and Control System.

d. Establish procedures for the Services to respond to NATO Air Command and Control System contract deliverables.

Management Comments. The ASD(C3I) partially concurred with Recommendations A.3.a. and A.3.d. and nonconcurred with Recommendations A.3.b. and A.3.c. The response stated that there was no unique U.S. portion of the Program; however, as a NATO member nation, the United States participates in all aspects of the Program. Since the Program had been restructured twice in the past 3 years to take into account the political and military changes in Europe, the preparation of a U.S. interoperability architecture at this time would be a waste of resources. Management also stated that the Services have been requested to review and comment on ACCS planning, technical, and operational documentation and to identify recommended changes or modifications, as appropriate. In addition, the United States has agreed to review the contract deliverables as part of the central region Regional Programming Office. The ASD(C3I) acknowledged that since the draft report was issued, the ASD(C3I) office has provided the Services and DISA policy guidance, established U.S. goals, and made the Air Force the lead Service for U.S. participation in the program.

Audit response. Regarding Recommendation A.3.a., because the ASD (C3I) memorandum, "NATO Air Command and Control System (ACCS)," August 3, 1992, provides policy guidance, establishes U.S. goals, and assigns responsibilities for U.S. participation in the Program, the intent of the recommendation is fully satisfied.

Regarding Recommendation A.3.b., we agree that there is no unique U.S. portion of the Program. At the time of our audit, a central program office had not been established to manage U.S. participation in the Program. In addition, the Air Force was the only Service to have established a primary office of responsibility to manage the Services' C3 systems interoperability requirements within the Program. The intent of our recommendation was to ensure maximum joint Service participation in the Program so that each of the Services' C3 systems interoperability requirements could be met. The ASD(C3I) August 1992 memorandum established the Air Force as the lead Service and required each Service to designate an office of primary responsibility for the Program. However, the ASD(C3I) must continue to support the Air Force's efforts to obtain adequate funding to ensure that the Air Force is successful in executing its lead Service responsibilities. The actions taken fully satisfy the intent of the recommendation.

Regarding Recommendation A.3.c., we agree that there have been substantial military changes in Europe in the last few years that have affected the Program. However, we do not agree that at this time, it would be a waste of resources to prepare an interoperability architecture. The Services requirement to be interoperable has remained constant since the inception of the Program in 1983. In order for the United States to adequately influence the requirements and specifications of the Program, an architecture is critical in determining interoperability requirements. In addition, the ASD(C3I) memorandum states that one of the U.S. goals for the Program is to "Ensure U.S. command, control, communications, intelligence and weapon systems are interoperable with ACCs." An architecture is crucial if this goal is to be achieved. Although the ASD(C3I) memorandum states that DISA should "provide support and assistance in the areas of compatibility and interoperability assessments, architectures, standards development and joint testing" for the Program, the memorandum does not require the development of an interoperability architecture. We request that the ASD(C3I) reconsider his position in responding to the final report.

Regarding Recommendation A.3.d., the United States and France have sent informal representatives to participate in the actions of the central region Regional Programming Office. Germany, Belgium, and the Netherlands comprise the Regional Programming Office, which was used as an informal forum for coordinating ACCS activities for those participating nations. The Regional Programming Office also provided a forum for participating nations to jointly review ACCS contract deliverables in order to

provide a quick turnaround of the Program's contract deliverables. Since the contract deliverables are extensive, each participating nation is responsible for providing an assessment on an assigned portion of the contract. These assessments are discussed among the participating nations and a coordinated response on the contract deliverable is submitted to NATO. On August 24, 1992, the United States began sending subject experts to the Regional Programming Office to address ACCS contract deliverables, and the Services have been requested to review and comment on ACCS planning, technical, and operational documentation. The actions meet the intent of the recommendation.

4. We recommend that the Assistant Deputy Chief of Staff for Operations and Plans, U.S. Army, designate a specific office with the responsibility to identify, consolidate, and incorporate all Army tactical command, control, and communications systems and equipment into the NATO Air Command and Control System.

5. We recommend that the Director, Space and Electronic Warfare, U.S. Navy, designate a specific office with the responsibility to identify, consolidate, and incorporate all Navy tactical command, control, and communications systems and equipment into the NATO Air Command and Control System.

6. We recommend that the Deputy Chief of Staff for Aviation, U.S. Marine Corps, designate a specific office with the responsibility to identify, consolidate, and incorporate all Marine Corps tactical command, control, and communications systems and equipment into the NATO Air Command and Control System.

Management comments. As of October 16, 1992, the Army, Navy, and Marine Corps had not responded to Recommendations A.4., A.5., and A.6.

Audit response. We request that the addressees of Recommendations A.4., A.5., and A.6. provide written comments in response to the final report.

STATUS OF RECOMMENDATIONS

		Response to Final Report Should Include		
Number	Addressee	Concur/Nonconcur	Proposed Action	Implementation Date
A.1.	CINCEUR [1]	N/R [2]	N/R	X
A.2.	D/JCS [3]	N/R	N/R	X
A.3.a.	ASD(C3I) [4]	N/R	N/R	N/R
A.3.b.	ASD(C3I)	N/R	N/R	N/R
A.3.c.	ASD(C3I)	X [5]	X	X
A.3.d.	ASD(C3I)	N/R	N/R	N/R
A.4.	ADCS [6]	X [7]	X	X
A.5.	D/SW [8]	X [7]	X	X
A.6.	DCS(A) [9]	X [7]	X	X

[1] Commander in Chief, U.S. European Command
[2] No further response required
[3] Director, Joint Staff
[4] Assistant Secretary of Defense (Command, Control, Communications and Intelligence)
[5] Response should provide reconsideration of position
[6] Assistant Deputy Chief of Staff, Department of the Army
[7] Response on the draft report not provided
[8] Director, Space and Electronic Warfare, Department of the Navy
[9] Deputy Chief of Staff for Aviation, Headquarters, U.S. Marine Corps

B. TACTICAL LIAISON

The Army and Marine Corps (the Components) have not established a liaison requirement in accordance with NATO Standardization Agreement 2101 (STANAG 2101), "Establishing Liaison," identifying the personnel and equipment needed as the communications link between NATO forces operating on land. EUCOM has not determined the communication systems necessary to support the liaison requirement. The Components' doctrine, Table of Organization and Equipment (TOE), and training do not include provisions for or recognize the STANAG 2101 requirement. As a result, the Components' ability to interoperate with multinational forces in the command and control mission cannot be assured.

DISCUSSION OF DETAILS

Background

Joint Publication 1, "Joint Warfare of the U.S. Armed Forces," November 1991, recognizes the critical role liaison teams play in C3 operations. It states:

> Experience shows liaison is a particularly important part of command, control, and communications in a joint force. Recalling Clausewitz' [Carl Clausewitz] analogy of a military force as an intricate machine, ample liaison parties, properly manned and equipped, may be viewed as a lubricant that helps keep that machine working smoothly. The Gulf War vividly demonstrated the role of effective liaison in both the joint and combined contexts.

NATO STANAG 2101. In June 1990, the United States ratified STANAG 2101, committing the Components to implement the liaison requirement. STANAG 2101 defines a liaison as the communication link necessary between different elements of military forces to ensure interoperability among multinational forces. STANAG 2101 states:

> . . . a liaison should, when possible, be reciprocal between higher, lower and adjacent formations. A liaison must be reciprocal when a force is placed under the command or control of a headquarters of a different nationality or a brigade size, and higher formations of different nationalities are adjacent.

STANAG 2101 requires a liaison team to be familiar with the operations of its command's organization and command and control and the "staff procedures" of the headquarters it is coordinating with. When operating at the Brigade headquarters level and above, a liaison team should have a thorough understanding of the tactical doctrine of the unit to which it is attached. STANAG 2101 also requires each ratifying nation to identify, equip, and train personnel for the liaison requirement.

During Operation Desert Storm, the Components provided several ad hoc liaison teams, to major multinational commands. Operation Desert Storm ad hoc teams were comprised of individuals whose positions were nonessential during the war and individuals whose units had not been identified to mobilize for Operation Desert Storm. These liaison teams were used only during the conflict and were later disbanded. The teams became the commander's eyes and ears across the theater, and their responsibilities included coordinating land operations, enhancing and assisting in communications, and establishing operational procedures among all ground forces. The Operation Desert Storm teams played an important role in reducing friction and operational difficulties normally associated with multinational forces.

European Command

General guidance. Joint Test Publication 3-0," Doctrine for Unified and Joint Operations," January 1990, requires the Commanders in Chief of the Unified Commands to prepare operational plans (OPLANs) that identify requirements and to develop the organizational structure necessary for operating effectively with multinational forces. Joint Publication 5-02.2, "Joint Operation Planning System Volume II OPLAN Formats and Guidance," March 1990, does not require a liaison function for multinational forces to be addressed in the tasking and responsibilities section of the Communications Annex of the OPLAN. As a result, the Communications Annexes of the European OPLANs for NATO support do not contain the STANAG 2101 liaison requirement. If those OPLAN's were to be implemented in response to a NATO crisis, effective communications could be impaired.

Intelligence communications planning guide. In May 1991, EUCOM approved the "U.S. European Command Intelligence Communications Planning Guide for Deploying Forces" to assist deploying intelligence units in their support mission. EUCOM plans to incorporate the guide as a supplement to its OPLAN. The planning guide describes the theater-level intelligence facilities supporting EUCOM, the intelligence products, the missions they support, the communications systems used to disseminate products, and the communications systems in Europe available to support deploying units. The guide provides intelligence units with a good baseline to develop detailed, well-coordinated support plans; however, command and control facilities and supporting communications equipment were not addressed in the guide.

Components

The Components have not identified, equipped, or trained the liaison teams to function under wartime command and control operations, as prescribed by STANAG 2101. During Operation Desert Storm, the liaison requirement was fulfilled by ad hoc teams that were inadequately equipped and unfamiliar with the warfighting doctrine of the other multinational forces.

Implementation. When the United States ratified STANAG 2101, the Components agreed to incorporate the liaison requirement into the Army Field Manual (FM) 101-5, "Staff Organization and Operations," and Fleet Marine Field Manual (FMFM) 3-1, "Command and Staff Action," by June 1991. Our audit showed that STANAG 2101 had not been incorporated as doctrine by the Components. FM 101-5 was under revision and was expected to be finalized by July 1992. Army officials have stated that the Liaison Section of the field manual will incorporate the STANAG 2101 requirement. FMFM 3-1 was also under revision and was not expected to be finalized until August 1993. Since ratification of the STANAG, an additional draft Marine Corps field manual, "Marine Air-Ground Task Force Combined Arms Teams," FMFM 2, had been issued for comments and was expected to be finalized by August 1992. Marine Corps officials have stated that both FMFMs will incorporate the STANAG 2101 requirement. Recognizing the time, energy, and extensive coordination needed to finalize field manuals, steps should be taken to ensure that the liaison requirement is included in final versions of the manuals. It should be noted that the approved Marine Corps Force Structure Plan (USMC 2001), December 1991, provides for liaison personnel in accordance with the STANAG 2101 requirement.

Equipment. The TOEs for Components do not identify the authorized equipment necessary to implement the STANAG 2101 requirement. The lack of communications planning and the rapid development of a TOE for the Operation Desert Storm liaison teams resulted in teams arriving in the theater with little or no equipment. For example, while in theater, a liaison team that was assigned to a multinational headquarters had to acquire additional equipment in order to make the communications system work. This same liaison team lacked the capability to provide ultrahigh-frequency tactical satellite terminals for those liaison groups advancing with the multinational forces. The ultrahigh-frequency tactical satellite was the primary means of communication between the multinational headquarters and advancing forces.

Other after-action reports from Operation Desert Storm identified the critical need for redundant communications capabilities. Another liaison team assigned to the Egyptian Headquarters could not provide the forward deploying liaison teams with redundant multichannel communication capabilities. Communications was provided on a single-channel radio. As a result, the lack of redundant capabilities restricted the communications range between the Egyptian Headquarters and forward deploying units. The problem was later resolved through sharing the Marine Corps' single-channel tactical satellite radios.

Training. In the January 1991 "Annual Report to the President and the Congress," the Secretary of Defense emphasized the need for realistic training. He stated:

> Training exercises and programs must emphasize joint and combined operations and test the interoperability of Active and Reserve forces. Training is the centerpiece of readiness, and readiness is essential to force effectiveness.

STANAG 2101 identifies liaison training as an essential element in coordinating the operations of multinational forces. Formal liaison training seldom occurs. The Components have not formally recognized the liaison requirement and have not established training programs to train personnel in vital liaison activities.

Multinational force training. The U.S. Army, Europe, and Seventh Army has not incorporated the training requirements of STANAG 2101 into its training plans and programs. A requirement does not exist to train soldiers in the liaison function during multinational training exercises. As a result, essential personnel are unfamiliar with the duties and responsibilities of the liaison function.

Operation Desert Storm force training. Training provided to the liaisons teams before their deployment to the Persian Gulf was inadequate because it focused primarily on individual skills rather than on the warfighting doctrine of other multinational forces. An Operation Desert Storm after-action report stated that liaison teams at multinational headquarters were training personnel rather than performing their liaison mission. For example, an Operation Desert Storm after-action report stated that one of the multinational headquarters, consisting of 10 nations, was rapidly organized. However, the headquarters' personnel lacked experience in conducting multinational operations at the Division level and above. As a result, the ad hoc liaison team was required to assist in training the headquarters' staff in the planning and operational duties of a Division. This training became a full-time responsibility for some members of the ad hoc team, which impeded and in some cases prevented the liaison team from performing its primary duties.

Operation Desert Storm equipment training. Before their deployment to the Persian Gulf, the U[illegible]aison teams were to receive training on each piece of co[illegible]unications equipment they were issued. However, their trainers were inexperienced on the equipment, space was not allocated to conduct the training, and time was not allotted to inventory equipment. As a result, the team departed the United States with a large amount of equipment on which they were untrained.

Summary

The new NATO strategy requires the United States to participate in the alliance as part of a multinational force. Liaison teams will become a critical element in ensuring the interface of

C3 operations during combined warfare. Commanders in Chief need to include the requirement for the liaison function in their OPLANs to ensure that adequate planning, training, and equipment are identified to meet the requirement. In addition, the Components must recognize the liaison requirement and properly equip and train their liaison assets. The liaison function must be recognized by the DoD as a critical element of modern warfare.

RECOMMENDATIONS, MANAGEMENT COMMENTS, AND AUDIT RESPONSES

1. We recommend that the Director, Joint Staff, revise Joint Staff Publication 5-02.2, "Joint Operation Planning System Volume II OPLAN [Operations Plan] Format and Guidance," to require a liaison function for multinational forces in the tasking and responsibilities section of the Communications Annex of Operations Plans.

Management comments. Comments from the Director, Joint Staff, did not address the recommendation.

Audit response. We request that written comments be provided in response to the final report.

2. We recommend that the Commander in Chief, U.S. European Command:

a. Determine the command, control, and communications facilities and supporting communication equipment required for all European Command liaison teams.

b. Identify the required command, control, and communications facilities and supporting equipment in the tasking and responsibilities section of the Communications Annexes of the European Operations Plans.

c. Incorporate the liaison requirement into the training program for multinational forces.

Management comments. The Commander in Chief, U.S. European Command, concurred with Recommendations B.2.a., B.2.b., and B.2.c. The response stated that EUCOM will work with its Service components in defining the composition and level of the required liaison teams. After completion of the coordination efforts, EUCOM will assist the Service components in identifying the needed C3 facilities and equipment for the liaison teams. In concert with the above actions, EUCOM will update Communication Annexes of OPLANS that address multinational operations by identifying C3 facilities and equipment. Lastly, the response stated that once liaison teams are established and equipped, EUCOM will incorporate the requirement for the liaisons to participate in multinational training exercises.

3. We recommend that the Commander, U.S. Army Training and Doctrine Command:

a. Incorporate Standardization Agreement 2101, "Establishing Liaison," into Army Field Manual 101-5, "Staff Organization and Operations."

b. Incorporate NATO Standardization Agreement 2101, "Establishing Liaison," into applicable unit training plans and programs.

c. Revise appropriate Tables of Organization and Equipment to incorporate additional equipment necessary to perform the liaison requirement as stated in Standardization Agreement 2101, "Establishing Liaison."

4. We recommend that the Commander, U.S. Army Europe and Seventh Army, take immediate steps to incorporate the NATO Standardization Agreement 2101, "Establishing Liaison," into training plans and programs of command units.

5. We recommend that the Commander, U.S. Marine Corps, Combined Development Command:

a. Incorporate NATO Standardization Agreement 2101, "Establishing Liaison," into the Fleet Marine Field Manual 2, "Marine Air - Ground Task Force Combined Arms Team" and Fleet Marine Field Manual 3-1, "Command and Staff Action."

b. Incorporate NATO Standardization Agreement 2101, "Establishing Liaison," into applicable unit training plans and programs.

c. Revise appropriate Tables of Organization and Equipment to incorporate additional equipment necessary to perform the liaison requirement as stated in Standardization Agreement 2101, "Establishing Liaison."

Management comments. As of October 16, 1992, the Departments of the Army and the Navy had not provided comments on Recommendations B.3., B.4., and B.5.

Audit response. We request that written comments be provided on Recommendations B.3., B.4., and B.5. in response to the final report.

STATUS OF RECOMMENDATIONS

umber	Addressee	Response to Final Report Should Include: Concur/Nonconcur	Proposed Action	Implementation Date
.1.	D/JCS [1]	X	X	X
.2.a.	CINCEUR [2]	N/R [3]	N/R	N/R
.2.b.	CINCEUR	N/R	N/R	N/R
.2.c.	CINCEUR	N/R	N/R	N/R
.3.a.	C/TRADOC [4]	X [5]	X	X
.3.b.	C/TRADOC	X [5]	X	X
.3.c.	C/TRADOC	X [5]	X	X
.4.	C/USAREUR [6]	X [5]	X	X
.5.a.	C/MC/CDC [7]	X [5]	X	X
.5.b.	C/MC/CDC	X [5]	X	X
.5.c.	C/MC/CDC	X [5]	X	X

/ Director, Joint Staff
/ Commander in Chief, European Command
/ No additional response required
/ Commander, U.S. Army Training and Doctrine Command
/ Response on the draft report not provided
/ Commander, U.S. Army, Europe, and Seventh Army
/ Commander, U.S. Marine Corps Combined Development Command

C. INTEROPERABILITY TEST INITIATIVES

The Joint Interoperability Test Center (JITC) cannot test U.S. tactical C3 systems capabilities with command and control systems of NATO member nations. The JITC has not established a C3 testbed link between the U.S. joint C3 test facility at Fort Huachuca and the NATO Supreme Headquarters, Allied Powers, Europe (SHAPE), Technical Center. In addition, the U.S. joint portable Tactical Digital Information Link (TADIL) tester has not been deployed to the EUCOM theater. As a result, during military operations, maximum C3 interoperability may not be achieved with NATO allies, impeding the command and control function.

DISCUSSION OF DETAILS

Background

DoD policy. DoD policy states that U.S. Armed Forces deployed to the European theater are to be interoperable with NATO forces. DoD Directive 2010.6 requires that the Services ensure NATO interoperability, especially for command, control, and information systems. Furthermore, it requires that the Chairman, Joint Chiefs of Staff, identify obstacles against and opportunities for the improvement of interoperability of U.S. Forces within NATO and that the opportunities and obstacles be reported to the Secretary of Defense and the appropriate Service for priority action.

Interoperability testing. The Secretary of Defense and the Joint Staff have tasked the Joint Interoperability and Engineering Organization (JIEO) (formerly, the Joint Tactical Command, Control, and Communications Agency), DISA, with ensuring interoperability between U.S. and NATO tactical C3 systems used in joint (U.S. Forces only) and combined operations. The responsibility for identifying interoperability testing needs of the Services and NATO member nations is the task of the JIEO's test arm, the JITC.

TADILs. Modern C3 systems use a variety of complex digital message designs called TADILs (see Appendix B), which allow C3 participants to exchange tactical information via over-the-air broadcasts or point-to-point transmissions. TADILs are used by C3 teams to obtain real-time information necessary for threat detection and assessment and weapons targeting. Equipment with TADIL capabilities can reduce the need for voice communications among the various linked participants and promote overall force effectiveness through enhanced communications, navigation, and identification of friend or foe capabilities.

NATO C3 Test Initiatives

Although a combined test capability is required by NATO Interoperability Planning Document, Volume 5, "NATO Common Interoperability Standards Testing Concept" (first draft),

December 6, 1989, JIEO has placed a low priority on developing its NATO TADIL testing capability. In the absence of a NATO TADIL testing capability, the JIEO investigated the feasibility of utilizing a portable TADIL tester or its C3 distributed testbed facility to perform testing. JIEO considered the following options: purchase a new portable TADIL tester; use its existing Joint Portable TADIL Tester; or use its C3 distributed testbed (this option would offer the most comprehensive test capability and require a satellite hookup with the SHAPE Technical Center). However, as of the time of the audit, no action had been taken by the JIEO.

Distributed Testbed Concept

Testing C3 systems is frequently not accomplished within the confines of a single test facility. The JITC functions as the main hub and test control center. The JITC is connected by leased telephone lines to participating test sites disbursed throughout the United States (see Appendix C). A main hub and test control center allows equipment to be tested from numerous and diverse locations using a variety of C3 scenarios. The distributed testbed technique saves the costs of transporting the systems to be tested, the testing personnel, and the test equipment to a single test location. In utilizing the distributed testbed approach, JIEO has played a major role in ensuring interoperability of tactical C3 systems that employ TADILs, such as the Airborne Warning and Control System and the AN/TSQ-73 "Missile Minder" - the C3 system for the fire coordination of Nike Hercules, HAWK, and PATRIOT SAMs weapon systems.

Test Link Between JITC and SHAPE Technical Center

The JITC has not established a C3 test link with the SHAPE Technical Center. Establishing a combined distributed testbed link with the SHAPE Technical Center would result in more effective and reliable C3 interoperability between U.S. and NATO systems. Malfunctions and weaknesses could be identified, isolated, and corrected earlier in the development of a particular system and reduce or eliminate costly improvements.

JITC testbed. The JITC is the newest and most modern DoD command, control, communications, and intelligence (C3I) joint interoperability test facility available for utilization by Unified and Specified Commands, the Services, DoD agencies and commercial activities. The JITC plans for, conducts, evaluates, and reports the results of C3I tests to interested parties. These tests include standards conformance (ability of a C3I system to perform specific functions in accordance with an applicable standard), interoperability, and performance, along with system effectiveness and force effectiveness analysis. In addition, the JITC tests circuit and data switching systems, command and control systems, and transmission systems. A discussion of the systems is in Appendix D. The versatility and

significant testing capabilities of the JITC testbed offers considerable opportunities to advance the state-of-the-art of modern technological warfare.

SHAPE testbed. The SHAPE Technical Center is an international military organization established to provide scientific and technical assistance to SHAPE. The SHAPE Technical Center undertakes system studies and operations research aimed at the improvement of the effectiveness of the forces of the Allied Command, Europe. In addition, the SHAPE Technical Center conducts research on weapon systems and military equipment and provides technical support during the development of the NATO ACCS Program and the NATO Integrated Communications System. Equipment available to the SHAPE Technical Center include experimental sensors; simulators; various data display facilities; and flexible, real-time data processing systems. With a staff of scientists and engineers from the NATO nations and with state-of-the-art laboratories and technical tools, the SHAPE Technical Center can take full advantage of the collective knowledge that exists within the NATO nations.

Benefits. The new NATO force structure emphasizes increased reliance on multinational reaction forces. This new structure requires more efficient interfaces and interworkings among various tactical communications and C3 systems in use and between tactical and strategic communications systems. Combined advanced testing with U.S. NATO Allies will help ensure implementation of NATO STANAGs by early detection, identification, and correction of system software deficiencies. The effects of software changes or the introduction of new technology to C3 systems could be easily diagnosed, ensuring continued, combined interoperability with NATO.

Joint Portable TADIL Tester

Purpose. JITC has the Joint Portable TADIL Tester (the Portable Tester) available for use by the Unified Commanders in Chief. The function of the Portable Tester is to provide the joint testing community with a portable computer system that can be deployed to locations worldwide to conduct TADIL A and B combined interoperability and performance testing. The Portable Tester will have the capability to test TADIL-J by the mid-1990's. Furthermore, the Portable Tester can also provide an exercise analysis capability that may be used as a vehicle for commanders to evaluate how well TADILs are satisfying their information exchange needs. The Portable Tester can collect, monitor, and analyze TADILs during any operation or exercise around the world while remaining a completely radio-silent, noninterfering network participant.

Capabilities. The Portable Tester creates preplanned TADIL messages. These messages are then transmitted to stimulate the C3 system being tested. The Portable Tester records all exchanged messages and produces a formatted report to facilitate

analysis for compliance with the TADIL message standard. For TADILs A and B testing, the Portable Tester can interface through communication equipment to link with participants in a C3 network. For TADIL J testing, the Portable Tester will be set up to participate on a Joint Tactical Information Distribution System network.

Overseas deployment. In 1989, the Portable Tester was deployed to Thailand to perform developmental testing of TADIL A. Plans show that the Portable Tester will be deployed to the Pacific theater to perform TADIL A maintenance tests and combined forces exercise support. Systems to be tested and exercises to be conducted are as follows:

- Thailand Royal Thai Air Defense System in 1992.
- Singapore Ground Entry Station in 1992.
- Korean Navy Tactical Data Systems, date to be determined.
- Australian Navy Tactical Data Systems, date to be determined.
- U.S. Pacific Command-sponsored combined exercises (RIMPAC 1992 and COBRA GOLD 1992) in the Pacific theater.

However, the Portable Tester has never been deployed, and plans have not been made to deploy it to the European theater.

Exercise analysis. Commanders that organize, manage, and employ numerous units participating in a TADIL network during military exercises, face the prospect of not having their systems' capabilities used to the maximum extent possible. Employment of the tester for exercise analysis in EUCOM would provide the EUCOM Commander with a means to evaluate how effectively TADILs A and B support information exchange requirements among various participants. As of the time of the audit, the European combatant commander was not using this analytical capability.

Operation Desert Storm employed the most ambitious TADIL network ever attempted by the United States, NATO, and Allied nations. Some of the data links employed included TADILs A and B. However, after-action reports indicate that TADIL capabilities were not exploited to their full potential. An "Operation Desert Shield-Desert Storm Special Edition Newsletter," March 1991, published by the Center for Army Lessons Learned, U.S. Army Combined Arms Command, concluded that all TADIL capable units must ensure that they know how to maximize their TADIL capabilities and use them in the best manner possible. Commanders who take necessary steps to effectively utilize TADILs would gain enhanced awareness of the tactical situations of elements above, below, and adjacent to their areas of operation.

RECOMMENDATIONS, MANAGEMENT COMMENTS, AND AUDIT RESPONSES

. We recommend that the Director, Joint Interoperability and ngineering Organization, Defense Information Systems Agency:

a. Negotiate a Memorandum of Agreement between the Joint nteroperability Test Center and the Supreme Headquarters, Allied owers, Europe, Technical Center to establish a distributed test- ed link.

b. Establish a test link between the Joint Interoperability est Center and the Supreme Headquarters, Allied Powers, Europe, echnical Center.

Management comments. The Director, Defense Information ystems Agency, partially concurred with Recommendations C.1.a. nd C.1.b. Although DISA agreed that a test link should be stablished between the JITC and SHAPE, DISA stated that egotiations for a Memorandum of Agreement should take place hrough the Allied Data Systems Interoperability Agency or the ri-Service Group for Communications/Electronics. DISA also ontended that a clear set of testing requirements should be pecified before connecting the JTIC and SHAPE testbeds. The esponse stated that most nations had rejected the first draft of he NATO Interoperability Planning Document, Volume 5, as nrealistic and unaffordable under the reduced force structure nvironment and drastically reduced infrastructure budget.

Audit response. Regarding Recommendation C.1.a., we cknowledge that the NATO Allied Data Systems Interoperability gency or the Tri-Service Group for Communications/Electronics re also appropriate forums to negotiate a Memorandum of greement between the JTIC and SHAPE. The new multinational task orce will demand increased interoperability between U.S. 3 systems and NATO allies' C3 systems, compelling the NATO llied Data Systems Interoperability Agency and the NATO ri-Service Group for Communications/Electronics to expand their oles in coordinating NATO interoperability testing. Our ecommendation was based on the success that the Strategic efense Initiative Office had negotiating directly with the SHAPE echnical Center. Since the SHAPE Technical Center's autonomy ermits it to establish legitimate contracts and international reaties with individual NATO nations, Strategic Defense nitiative officials negotiated directly with the SHAPE Technical enter instead of involving the NATO Allied Data Systems nteroperability Agency or the NATO Tri-Service Group for ommunications/Electronics. We request that management econsider its position in responding to the final report.

Regarding Recommendation C.1.b., the new concept of an integrated multinational force will require a considerable increase in C3 interoperability among participating national forces. NATO Defense Ministers have set 1995 as the deadline for the new force structure to become operational. We acknowledge that specific testing requirements have not yet been identified and that the NATO Allied Data Systems Interoperability Agency has substantially diluted the content of the testing concept for NATO Command Interoperability Standards (i.e., NATO Interoperability Planning Document, Volume 5). However, the dilution of the NATO testing concept does not abrogate the requirement for NATO or nationally owned C3 systems used by NATO forces to be interoperable. All NATO members would have the opportunity to realize maximum testing potential (interoperability) if the JTIC and SHAPE Technical Center testbeds were linked together. We request that management reconsider its position in responding to the final report.

2. We recommend that the Commander in Chief, U.S. European Command, use the Joint Portable Tactical Digital Information Link Tester in evaluating the effectiveness of Tactical Digital Information Link capabilities to ensure its full exploitation in future training exercises.

Management comments. The Commander in Chief, U.S. European Command, concurred with the recommendation and stated that the EUCOM will coordinate availability of the Joint Portable Tactical Digital Information Link Tester with the JIEO for upcoming training exercises.

STATUS OF RECOMMENDATIONS

		Response to Final Report Should Include		
Number	Addressee	Reconsideration of Position	Proposed Action	Implementation Date
C.1.a.	D/JIEO 1/	X	X	X
C.1.b.	D/JIEO 1/	X	X	X
C.2.	CINCEUR 2/	N/R 3/	N/R	N/R

1/ Director, Joint Interoperability and Engineering Organization, DISA
2/ Commander in Chief, U.S. European Command
3/ No additional response required

PART III - ADDITIONAL INFORMATION

APPENDIX A - Schedule of NATO Air Command and Control System Deliverables

APPENDIX B - Tactical Digital Information Links (TADILs A, B, and J)

APPENDIX C - Command and Control Distributed Testbed Nodes

APPENDIX D - Types of Systems Tested

APPENDIX E - Summary of Potential Benefits Resulting from Audit

APPENDIX F - Activities Visited or Contacted

APPENDIX G - Report Distribution

APPENDIX A: SCHEDULE OF NATO AIR COMMAND AND CONTROL SYSTEM DELIVERABLES 1/

No.	Deliverables	Estimated Delivery Date
1.	Operational Requirements Document	September 18, 1991 2/
2.	Draft System Logical Model	May 21, 1992
3.	Draft Overall System Specification	May 21, 1992
4.	Combined Air Operation Center Logical Model and Specification	October 9, 1992
5.	Air Control Center Logical Model and Specification	October 9, 1992
6.	Sensor Fusion Post Logical Model and Specification	October 9, 1992
7.	Maritime ACCS Ship and Shore Tactical Interface Component Logical Model and Specification	November 26, 1992
8.	Recognized Air Picture Production Center Logical Model and Specification	November 26, 1992
9.	Surface-to-Air Missile Operations Center Logical Model and Specification	November 26, 1992
10.	Air Control Unit Logical Model and Specification	November 26, 1992
11.	Air Operations Coordination Center Logical Model and Specification	January 21, 1993
12.	Wing Operations Center Logical Model and Specification	January 21, 1993
13.	Squadron Logical Model and Specification	January 21, 1993
14.	Air Traffic Control Radar Unit Logical Model and Specification	January 21, 1993
15.	Reporting Post Logical Model and Specification	January 21, 1993
16.	Communication Specification	January 21, 1993
17.	Final Overall System Specification, System Logical Model and Operational Requirements Document	February 11, 1993

1/ Documents describing system specification requirements for the NATO ACCS.
2/ Actual delivery date.

APPENDIX B: TACTICAL DIGITAL INFORMATION LINKS (TADILs) A, B, AND J

TADIL A. TADIL-A is a two-way data link, operating on high frequency and ultrahigh frequency. The TADIL is a secure system with no jam-resistant capability. It functions as the primary link for surveillance, combat weapons direction, and battle management. Originally, the TADIL was developed as an Anti-Air Warfare link for use on aircraft carriers and guided missile cruisers. Its role has expanded to include many other Navy ships, and it is now implemented on E-2C, S-3, and P-3 aircraft.

TADIL B. The operational use of TADIL B is identical to that of TADIL-A. The architecture, however, is significantly different. TADIL B is a hierarchical system with one unit directly connected to the other unit. TADIL B is secure and uses two dedicated channels per user.

TADIL J. TADIL J is a revolutionary and generational advancement in data link development. The Joint Tactical Information Distribution System and the Multifunctional Information Distribution System are the transmission systems that support TADIL J. TADIL J will provide tactical decision makers with survivable, secure, antijam, high-capacity communication, navigational, and identification capabilities.

APPENDIX C: COMMAND AND CONTROL DISTRIBUTED TESTBED NODES

Service/ OSD	Location	System Tested
Air Force	Langley Air Force Base (AFB), VA	Tactical Air Control System
	Tinker AFB, OK	Airborne Warning and Control System/E-3
Army	Redstone Arsenal, AL	PATRIOT and HAWK Missile System
Navy	Dahlgren, VA	AntiAir Warfare Weapon System
	Dam Neck, VA	Naval Tactical Data Systems-Light
	Point Loma, CA	Naval Tactical Data Systems Shipboard and Airborne Tactical Data Systems/E-2C
Marine Corps	Camp Pendleton, CA	Marine Air Command and Control Systems
ASD(C3I)	Falls Church, VA	Command and Control Systems
	Fort Worth, TX	Command and Control Systems
	Kelly AFB, TX	Command and Control Systems

APPENDIX D: TYPES OF SYSTEMS TESTED

The Joint Interoperability Test Center provides testing of the following systems.

Circuit switching systems. A circuit switch is an electronic device that allows a temporary voice link between two users in a communications network. The JITC's test capability covers the full spectrum of tactical and strategic circuit switches in the DoD inventory. The JITC provides:

- C3I Standards (military, Federal, and commercial) development and conformance testing;
- tactical and strategic interoperability, performance, and effectiveness testing; and
- testing support of DoD, Federal, and commercial research and development programs.

Data switching systems. Data switching systems send data through switches that are capable of temporarily storing data until a circuit becomes available. When a circuit is available, the data are forwarded and continue to their destination. The JITC tests for interoperability, performance, and effectiveness of data terminal switching systems.

Command and control systems. The command and control systems test facility at the JITC provides the ability to test command and control systems software, including TADILs A, B, and J and Message Text Formats.

The Micro-Message Analysis System furnishes a personal computer-based system by which Message Text Formats are tested and certified. The command and control systems testbed mission includes:

- developmental and operational certification testing of command and control systems that implement TADILs A, B, and J and Message Text Format standards;
- interoperability and performance testing of command and control systems employing TADILs A, B, and J and Message Text Formats; and
- support of DoD, Federal, and commercial research and development.

Transmission systems. Transmission systems consist of both terrestrial and nonterrestrial radios to include satellite, tactical line-of-sight and high-frequency equipment. The transmission systems test bed:

- supports performance standards development and conformance testing (military, Federal, commercial);
- tests for C3I interoperability and performance of DoD transmission media (e.g., satellite communications, line-of-sight, and fiber-optic cable); and
- supports DoD, Federal, and commercial research and development.

APPENDIX B: SUMMARY OF POTENTIAL BENEFITS RESULTING FROM AUDIT

Recommendation Reference	Description of Benefits	Type of Benefit
A.1. and A.2.	Program Results. Improved joint and combined force effectiveness by formally sanctioning U.S. involvement in NATO ACCS Program.	Nonmonetary
A.3.a.	Program Results. Improved joint and combined force effectiveness by directing the Services' implementation of NATO ACCS.	Nonmonetary
A.3.b.	Program Results. Increased effectiveness by identifying a joint program office to ensure all Services fully participate in NATO ACCS Program.	Nonmonetary
A.3.c.	Program Results. Improved overall force effectiveness by analyzing tactical C3 systems' ability to interface with NATO ACCS.	Nonmonetary
A.3.d.	Program Results. Increased joint force effectiveness by ensuring U.S. operational requirements are included in NATO ACCS Program.	Nonmonetary
A.4., A.5., and A.6.	Program Results. Increased force effectiveness by ensuring the Services' needs are integrated in NATO ACCS Program.	Nonmonetary
B.1.	Program Results. Improved overall force effectiveness by planning for the liaison requirement.	Nonmonetary
B.2.a.	Program Results. Increased joint force effectiveness by determining theater liaison needs for C3 facilities and equipment.	Nonmonetary
B.2.b.	Program Results. Increased joint force effectiveness by including theater C3 facilities and equipment liaison needs in OPLANs.	Nonmonetary

APPENDIX E: SUMMARY OF POTENTIAL BENEFITS RESULTING FROM AUDIT
(Cont'd)

Recommendation Reference	Description of Benefits	Type of Benefit
B.2.c.	Program Results. Improved joint force readiness by scheduling liaison training in multinational exercises.	Nonmonetary
B.3.a. and B.5.a.	Program Results. Increased combined force effectiveness by including the liaison requirement in training manuals.	Nonmonetary
B.3.b. and B.5.c.	Program Results. Increased readiness by incorporating equipment requirements in the Table of Organization and Equipment.	Nonmonetary
B.3.b., B.4., and B.5.b.	Program Results. Increased readiness by incorporating combined liaison training requirement into the theater of operations training plans.	Nonmonetary
C.1.a.	Program Results. Provides authority to establish test bed for testing U.S. tactical C3 systems with Allies.	Nonmonetary
C.1.b.	Program Results. Increased joint force effectiveness by establishing distributed test bed link with Allies and maximizing combined C3 systems interoperability.	Nonmonetary
C.2.	Program Results. Increased joint effectiveness by deploying and using portable tactical data information link tester in European theater exercises.	Nonmonetary

APPENDIX F: ACTIVITIES VISITED OR CONTACTED

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition (International Programs), Washington, DC
Assistant Secretary of Defense (Command, Control, Communications and Intelligence), Washington, DC
Assistant Secretary of Defense (International Security Policy), Washington, DC
Assistant Secretary of Defense (Program Analysis and Evaluation) Washington, DC
Strategic Defense Initiative Organization, Washington, DC
U.S. Mission, North Atlantic Treaty Organization, Brussels, Belgium

The Joint Staff

Office of the Director, Operations (J-3), Washington, DC
Office of the Director, Command, Control, and Communications (J-6), Washington, DC
Office of the Director, Operational Plans and Interoperability (J-7), Washington, DC
Office of the Secretary, Joint Staff, Documents Division, Washington, DC

Department of the Army

Chief of Staff, U.S. Army, Washington, DC
Office of the Deputy Chief of Staff for Operations and Plans (Force Development), Washington, DC
Office of the Director, Information Systems for Command, Control, Communications and Computers, Washington, DC
U.S. Army Operational Test and Evaluation Command, Alexandria, VA
U.S. Army, Europe, and Seventh Army, Campbell Barracks, Heidelberg, Germany
Headquarters, 32d Army Air Defense Command, Darmstadt, Germany
U.S. Army Central Command, Fort McPherson, GA
U.S. Army Training and Doctrine Command, Fort Monroe, VA
U.S. Army Combined Arms Command, Fort Leavenworth, KS

Department of the Navy

Chief of Naval Operations, U.S. Navy, Washington, DC
Office of the Director, Space and Electronic Warfare, Command and Control Electronic Warfare Systems, Washington, DC
U.S. Navy Europe, London, England

Department of the Air Force

Chief of Staff, U.S. Air Force, Washington, DC
Office of the Deputy Chief of Staff for Command, Control, Communications and Computers, Washington, DC

APPENDIX F: ACTIVITIES VISITED OR CONTACTED (Cont'd)

Department of the Air Force (Cont'd)

Office of the Deputy Chief of Staff for Plans and Operations, Washington, DC
Headquarters, Tactical Air Command, Langley AFB, VA
U.S. Air Forces, Europe, Ramstein Air Base (AB), Germany
Headquarters, 601st Tactical Control Wing, Sembach AB, Germany
1st Combat Communications Squadron, Lindsey AB, Germany
Aeronautical Systems Division, Wright-Patterson AFB, OH
Electronics Systems Division, Hanscom AFB, MA
U.S. Central Command Air Forces, Shaw AFB, SC
Headquarters, Ninth Air Force, Shaw AFB, SC
Headquarters, 507th Tactical Air Control Wing, Shaw AFB, SC

Marine Corps

Commandant, U.S. Marine Corps, Washington, DC
Headquarters, U.S. Marine Corps, Arlington, VA
Office of the Deputy Chief of Staff for Aviation, (Plans, Policy and Requirements Division), Arlington, VA
Office of the Director, Command, Control, Communications and Computer Division (Command and Control Interoperability Division), Arlington, VA
U.S. Marine Corps Combat Development Command (Warfighting Center) Quantico, VA
Headquarters, 2d Marine Aircraft Wing, Marine Corps Air Station, Cherry Point, NC

Other U.S. Commands and NATO Command

Headquarters, U.S. European Command, Patch Barracks, Stuttgart-Vaihingen, Germany
U.S. Central Command, Macdill AFB, FL
Central Army Group, North Atlantic Treaty Organization, Campbell Barracks, Heidelberg, Germany

Defense Agencies

Defense Information Systems Agency, Arlington, VA
Joint Engineering and Interoperability Organization, Reston, VA
Joint Interoperability Test Center, Fort Huachuca, AZ

Non-Government Activities

Institute for Defense Analyses, Alexandria, VA
Veda, Alexandria, VA
Intelligence Communications Architecture Project Office, Reston, VA

APPENDIX G: REPORT DISTRIBUTION

Office of the Secretary of Defense

Assistant Secretary of Defense (Command, Control, Communications and Intelligence)

Department of the Army

Secretary of the Army
Inspector General
Auditor General, U.S. Army Audit Agency

Department of the Navy

Secretary of the Navy
Commandant of the Marine Corps
Assistant Secretary of the Navy (Financial Management)
Auditor General, Naval Audit Service

Department of the Air Force

Secretary of the Air Force
Assistant Secretary of the Air Force (Financial Management and Comptroller)
Air Force Audit Agency

The Joint Staff

Director, Joint Staff

Other Commands

U.S. European Command

Defense Agencies

Defense Information Agency

Non-DoD Activities

Office of Management and Budget
U.S. General Accounting Office, NSIAD Technical Information Center

Chairman and Ranking Minority Member of the Following Congressional Committees and Subcommittees:

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services

APPENDIX G: REPORT DISTRIBUTION (Cont'd)

Non-DoD Activities (Cont'd)

Senate Subcommittee on Readiness, Sustainability, and Support,
Committee on Armed Services
Senate Subcommittee on Conventional Forces and Alliance Defense,
Committee on Armed Services
Senate Committee on Budget
Senate Committee on Governmental Affairs
Senate Select Committee on Intelligence
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
House Committee on Armed Services
House Subcommittee on Readiness, Committee on Armed Services
House Committee on Government Operations
House Subcommittee on Legislation and National Security,
Committee on Government Operations
House Committee on Foreign Affairs
House Subcommittee on Europe and the Middle East,
Committee on Foreign Affairs
House Permanent Select Committee on Intelligence

PART IV - MANAGEMENT COMMENTS

Assistant Secretary of Defense (Command, Control, Communications, and Intelligence)

Joint Staff

U.S. European Command

Defense Information Systems Agency

Comments from Assistant Secretary of Defense (Command, Control, Communications and Intelligence)

COMMAND CONTROL COMMUNICATIONS AND INTELLIGENCE

ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D C 20301-3040

August 27, 1992

MEMORANDUM FOR DIRECTOR, READINESS AND OPERATIONAL SUPPORT,
OFFICE OF THE ASSISTANT INSPECTOR GENERAL
FOR AUDITING

SUBJECT: Draft Audit Report on Tactical Command, Control and Communications Interoperability (Project No. 1RA-0048)

The subject report has been reviewed and the following comments are offered to those recommendations directly pertaining to this office.

As you pointed out in your report, the Air Command and Control System (ACCS) is a NATO program. Therefore, there is no unique U.S. portion of the program. As a member nation the U.S. participates in all aspects of the program. We are committed to providing our main NATO Defense Forces and Augmentation Forces with the capability of being linked into the overall NATO Command and Control structure as defined in the 1992 NATO Defense Planning Review. It is also important to note that the North Atlantic Council (NAC) approved the Charter for a NATO Air Command and Control System Management Organization (NACMO). The Charter defines the responsibilities, structure and operation of the organization managing the ACCS program. The organization consists of a Board of Directors (BOD), subordinate committees and a NATO ACCS Management Agency (NACMA). The Agency is the procurement and implementation and configuration management f r ACCS. To date the NACMA is staffed with 61 positions.

Additionally, since your draft report was issued, we have provided the Military Departments and the Defense Information Systems Agency (DISA) with policy guidance, established U.S. goals and assigned the Air Force as the lead service for U.S. participation in the program. A copy of that memorandum is at Attachment 2.

Our detailed comments on each of the recommendations addressed to this office are provided (Attachment 1). We appreciate the opportunity to comment on the report.

Duane P. Andrews

Attachments

Final Report Reference

INSPECTOR GENERAL DRAFT AUDIT REPORT - DATED JUNE 30, 1992

TACTICAL COMMAND, CONTROL AND COMMUNICATIONS INTEROPERABILITY

PROJECT NO 1RA-0048

ASSISTANT SECRETARY OF DEFENSE (C3I) COMMENTS

*****

RECOMMENDATIONS

11 RECOMMENDATION 1: The IG recommended that the Assistant Secretary of Defense (C3I) establish milestones and program goals for the Services' implementation of the NATO Air Command and Control System (ACCS). (P. 19/IG Draft Report)

ASD(C3I) Response: Partially Concur. The responsibility for establishing program milestones resides with the ACCS Board of Directors (BOD). The NATO ACCS Management Agency (NACMA), by Charter, has the responsibility for program planning, system engineering and implementation. The NACMA prepares program milestones for approval by the BOD following the policy and general guidance provided by the BOD. The ASD(C3I) memorandum, dated August 3, 1992, provides policy guidance, establishes U.S. goals, and assigns responsibilities for U.S. participation in the NATO ACCS program.

11 RECOMMENDATION 2: The IG further recommended that the ASD(C3I) designate a joint program office to manage the U.S. portion of the NATO Air Command and Control System Program. (P. 19/Draft Report)

ASD(C3I) Response: Nonconcur. ACCS is a NATO program to be fielded in Europe to provide NATO with a modern air command and control capability. As such there is no U.S. portion to the program. The U.S. will not be a host nation for system implementation. The U.S. participates in the program as a NATO member nation and as a contributor to the NATO infrastructure program. NATO has established an agency (NACMA) under the policy and direction of a BOD responsible to the North Atlantic Council. The U.S. continues to support the program and is committed to maintaining interoperability with ACCS. We provide appropriate participation in ACCS planning and implementation and have a small staff of national experts assigned to NACMA. The cost of providing a U.S. joint program office is considered unnecessary. Appropriate U.S. goals and objectives can be obtained through participation in the various ACCS bodies and participation by the Military Departments and the Defense Information Systems Agency, as described in the ASD(C3I) memorandum dated August 3, 1992.

Final Report Reference

11

RECOMMENDATION 3: The IG further recommended that the ASD(C3I) require the Defense Information Systems Agency (DISA) to prepare an interoperability architecture for the U.S. segment of the NATO Air Command and Control System. (P. 19/Draft Report)

ASD(C3I) Response: Nonconcur. The ACCS program has been restructured two times during the past three years to take into account the political and military changes in Europe, NATO's new streamlined command structure and the declining infrastructure budget. The program may require yet another restructure due to the further decline in the infrastructure program. The preparation of a U.S. interoperability architecture is considered a waste of U.S. resources at this time. The DISA has been requested to support the program and assist in the areas of compatibility and interoperability assessments, architectures, standards development and joint testing, as appropriate.

11

RECOMMENDATION 4: The IG further recommended that the ASD(C3I) establish procedures for the Services to respond to NATO Air Command and Control contract deliverables. (P. 19/Draft Report)

ASD(C3I) Response: Partially concur. The Services have been requested to review and comment on ACCS planning, technical and operational documentation and identify recommended changes or modifications, as appropriate. As the contracting agency, NACMA is responsible for contract deliverables. National comments are provided to NACMA in order to provide the maximum level of review possible. Procedures and milestones for review of the deliverables have been established by NACMA consistent with the contract. Due to the magnitude of the specifications to be delivered and the time span over which the deliverables will be provided, the U.S. has agreed to review the contract deliverables as part of the central region Regional Programming Office effort by providing subject experts.

Comments from Assistant Secretary of Defense (Command, Control, Communications and Intelligence) (Continued)

COMMAND CONTROL COMMUNICATIONS AND INTELLIGENCE

ASSISTANT SECRETARY OF DEFENSE

WASHINGTON D C 20301-3040

3 AUG 1992

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
DIRECTOR, DEFENSE INFORMATION SYSTEMS AGENCY

SUBJECT: NATO Air Command and Control System (ACCS)

This memorandum provides policy guidance, establishes U.S. goals and assigns Air Force lead service responsibilities for U.S. participation in the NATO ACCS program.

On April 15, 1992, the North Atlantic Council agreed to the NATO ACCS Management Organization (NACMO) Board of Directors (BOD) proposed restructure of the ACCS program. The program was restructured to take into account the political and military changes in Europe, NATO's new streamlined command structure and the declining infrastructure budget. The agreed program is based on an evolutionary implementation, with an aim of providing an initial operational capability by 1998. SACEUR has given his support for the program and has provided a funding baseline through 1998.

The U.S. continues to support the program and is committed to maintaining interoperability with ACCS. We will continue our leadership role in the program through appropriate participation in ACCS planning and implementation at all levels. To this end, the following U.S. goals are hereby established:

1. Participate with SHAPE in defining the concept and integration of a Deployable ACCS Component (DAC).

2. Ensure U.S. command, control, communications, intelligence and weapon systems are interoperable with ACCS.

3. Influence the ACCS system specifications and implementation to facilitate the integration and interoperability of U.S. systems.

4. Ensure that ACCS is technically sound and cost effective.

5. Ensure that U.S. industry is afforded equal opportunity to compete.

In order to ensure that these goals are met, it is essential that we establish and execute a consistent policy. My office will continue to provide overall program policy and representation to the NACMO BOD. It is our intent to transition the BOD responsibility to the Air Force when the program becomes an acquisition program with significant U.S. procurement responsibilities or it reaches the NATO equivalent of Milestone I. The Joint Staff will continue to validate all joint operational requirements. The Defense Information Systems Agency (DISA) will provide support and assistance in the areas of compatibility and interoperability assessments, architecture, standards development and joint testing as appropriate.

Active participation by all Services is considered vital to U.S. interoperability goals. ACCS system level specifications will be completed during the first quarter 1993, with software development to begin by mid 1994. In order to support these program milestones, the following near-term objectives are established:

1. Review and comment on ACCS planning, technical and operational documentation and identify recommended changes or modifications as appropriate.

2. Evaluate existing and planned U.S. systems for compatibility and interoperability with ACCS and recommend any U.S. deployable systems which should be considered candidates to fulfill ACCS functions.

3. Develop long-term U.S. plans and objectives to ensure that U.S. forces in Europe and any augmentation forces can be fully integrated into the ACCS architecture.

4. Provide experts to the U.S. national experts office at the NATO ACCS Management Agency, Brussels, Belgium.

Request that an office of primary responsibility be designated within each service and DISA within 30 days and that a point of contact be provided to Mr. Robert A. Giacomo of my staff, 697-6726, Room 3D174.

Duane P. Andrews

Comments from Joint Staff

THE JOINT STAFF
WASHINGTON, D.C.

Reply ZIP Code:
20318-0300

DJSM-1047-92
31 August 1992

MEMORANDUM FOR THE INSPECTOR GENERAL, DEPARTMENT OF DEFENSE

Subject: Draft Audit Report on Tactical Command, Control, and Communications Interoperability (Project No. 1RA-0048)

1. The Joint Staff has reviewed the draft audit report* and provides the enclosed comments.

2. Joint Staff point of contact is Mr. Malcolm R. Billings, extension 47005.

RUDOLPH OSTOVICH III
Major General, US Army
Vice Director, Joint Staff

Enclosure

Reference:
* DOD IG memorandum, 30 June 1992, "Draft Audit Report on Tactical Command, Control, and Communications Interoperability (Project No. 1RA-0048)"

Final Report Reference

ENCLOSURE

JOINT STAFF COMMENTS ON
DRAFT AUDIT REPORT (PROJECT NO. 1RA-0048)

1. Page i, Audit Results, 1st paragraph. Comment: This paragraph gives a misleading impression that the full range of US and NATO tactical C3 interoperability efforts were examined. Full combined interoperability (operational, doctrinal, procedural and technical) with NATO allies remains US policy. Difficulties in achieving this goal are not caused by a lack of commitment by the Department of Defense, but result from expected differences in system implementations by the NATO nations. The NATO Council agreed interoperability strategy, strongly endorsed and practiced by the United States, is to pursue interoperability through the development and implementation of common standards. Currently, procedural and technical standards for information exchange in support of all NATO initiatives including the Air Command and Control System (ACCS) Program will be, or are being, developed in the Allied Data Systems Interoperability Agency (ADSIA) and the Tri-Service Group for Communications-Electronics. These forums and their subordinate structures are strongly supported by the Joint Staff, OASD(C3I), the Services, and DISA. US national positions are coordinated through the Military Communications-Electronics Board.

11 2. Page ii, Audit Results, 1st subparagraph. Comment: Annex I to JSCP requires joint C3 planners at the CINC level to consider and include coordinated liaison requirements as part of operational plans.

3 3. Page 7, paragraph A. Comment: We know of no requirement to integrate US C3 systems into ACCS. There is, however, a requirement that our systems interoperate with other NATO and national systems supporting ACCS. This requirement has been validated by US approval of MC 245 in the NATO Military Committee, and the NATO Interoperability Management Plan by the North Atlantic Council.

4 4. Page 17, 1st paragraph. Comment: The real issue is that there are no currently validated information exchange requirements for ACCS. Without these, there is no way to determine the extent of interoperability required by Service systems--or systems of other NATO nations. Indications are that no SHAPE-validated requirements will be available until late 1993.

Enclosure

1

Final Report Reference

10

5. Page 18, paragraph 1. Comment: The Joint Staff will certainly initiate action to validate the US ACCS Plan upon receipt from USCINCEUR.

13

6. Pages 19 and 20, paragraphs 4, 5, and 6. Comment: The recommendation to identify, consolidate, and incorporate all tactical C3 systems and equipment into the NATO ACCS is unrealistic and unnecessary. The proper recommendation should be to identify and incorporate into the NATO ACCS those critical US tactical communications systems required for the planning and execution of joint and/or combined operations.

23

7. Page 35, 1st paragraph. Comment: Most nations rejected the first draft of the NATO Interoperability Planning Document, Volume 5, as unrealistic and unaffordable under the reduced manpower environment and drastically reduced infrastructure budget. The final version envisions ADSIA as a facilitating agent for bilateral and/or multilateral testing of systems using national facilities. Although many nations now test their Link 11 systems for compliance with STANAG 5511, interoperability testing between Link 11/TADIL A systems of different nations is a more difficult problem because of differing implementation strategies--primarily driven by cost and retrofit schedules. Under these conditions, the establishment of a test facility at the SHAPE Technical Centre may fall short of the objectives described in the draft audit report.

Enclosure

2

Comments from Commander in Chief, U.S. European Command

28-AUG-1992 14:46 HQUSEUCOM COMPTROLLER S.02

ROUTINE

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HQ USEUCOM
COMMUNICATIONS CENTER

PAGE 01
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INFO RUEKJCS/JOINT STAFF WASHINGTON DC//DJS//
RUSDECA/DAIG INV LINDSEY AS GW//AUD//
RUSNNOA/USCINCEUR VAIHINGEN GW//SPACOS/ECJ1/ECJ2/ECJ3/ECJ4/
ECJ5/ECJ6/ECCM//
RUEKJCS/HQ USEUCOM LO WASHINGTON DC//
BT
UNCLAS FOUO
AMPN/SUBJECT DODIG DRAFT AUDIT REPORT ON TACTICAL COMMAND
CONTROL, AND COMMUNICATIONS (C3) INTEROPERABILITY PROJECT NO 1RA-
9048//.

REF/MEMO/DODIG/30JUN92//
AMPLN/1. AS INVITED BY REFERENCE MEMO, USEUCOM SUBMITS THE
FOLLOWING COMMENTS IN RESPONSE TO THE FINDINGS/RECOMMENDATIONS FOR
THIS COMMAND CONTAINED IN SUBJECT REPORT.
A. FINDING A/RECOMMENDATION 1. CONCUR. CORRECTIVE ACTION
USEUCOM IS PREPARED TO RESUBMIT THE U.S. AIR COMMAND AND CONTROL
SYSTEM (ACCS) PLAN (USAAP) TO THE JOINT STAFF FOR VALIDATION.
HOWEVER, WE MUST FIRST RESOLVE THE ISSUES THAT RESULTED IN THE JOINT
STAFF RETURNING THE PLAN IN OCT 88. THESE ISSUES INCLUDE SPECIFIC
NEED FOR A SPECIFIC MANAGEMENT/STRATEGY ANNEX, AND INCLUSION OF
CERTAIN U.S. SYSTEMS IN THE PLAN. THIS SHOULD BE DONE IN VIEW OF
TODAY'S CHANGED EUROPEAN ENVIRONMENT. ONCE THESE ISSUES ARE
RESOLVED, WE ESTIMATE A THREE TO FIVE MONTH EFFORT TO PROVIDE AN
UPDATED PLAN TO THE JOINT STAFF FOR VALIDATION. ESTIMATED
COMPLETION DATE: 31 MAR 93.
B. FINDING B/RECOMMENDATION 2.A. CONCUR. CORRECTIVE ACTION
AS THE DRAFT REPORT NOTES, THE STANAG 2181 LIAISON REQUIREMENT IS
BEING INCORPORATED BY THE ARMY AND MARINE CORPS INTO REVISIONS OF
THE APPROPRIATE FIELD MANUALS. USEUCOM WILL WORK WITH OUR SERVICE
COMPONENTS IN DEFINING THE COMPOSITION AND LEVEL OF THE REQUIRED
LIAISON TEAMS. ONCE THIS IS ACCOMPLISHED, WE WILL ASSIST THE
SERVICE COMPONENTS TO IDENTIFY THE NEEDED C3 FACILITIES AND
EQUIPMENT FOR THE LIAISON TEAMS. ESTIMATED COMPLETION DATE: 30 JUN
93.
C. FINDING B/RECOMMENDATION 2.B. CONCUR. CORRECTIVE ACTION
IN CONCERT WITH THE ACTIONS DESCRIBED IN PARA B ABOVE USEUCOM
COMMUNICATIONS ANNEXES TO OPLANS WHICH ADDRESS MULTINATIONAL PLATO
AND COALITIONS OPERATIONS WILL BE UPDATED TO IDENTIFY C3 FACILITIES
AND EQUIPMENT. COMPLETION DATE: 31 OCT 93.
D. FINDING B/RECOMMENDATION 2.C. CONCUR. CORRECTIVE ACTION:
ONCE LIAISON TEAMS ARE ESTABLISHED AND EQUIPPED, WE WILL INCORPORATE
THE REQUIREMENT FOR THE LIAISON FUNCTION TO EXERCISE REGULARLY IN
MULTINATIONAL TRAINING EXERCISES. COMPLETION DATE: 31 DEC 93.
E. FINDING C/RECOMMENDATION 3. CONCUR. CORRECTIVE ACTION: WE
WILL COORDINATE AVAILABILITY OF THE JOINT PORTABLE TACTICAL DIGITAL
INFORMATION LINK TESTER WITH THE JOINT INTEROPERABILITY AND
ENGINEERING ORGANIZATION FOR UPCOMING SCHEDULED EXERCISES.
COMPLETION DATE: 30 SEP 93
2. WE APPRECIATE THE OPPORTUNITY TO PROVIDE COMMENTS ON THE
FINDINGS/RECOMMENDATIONS OF SUBJECT DRAFT REPORT. USEUCOM REMAINS
COMMITTED TO IMPROVE THE INTEROPERABILITY OF TACTICAL C3 SYSTEMS
WITHIN THIS THEATER.//
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UNCLASSIFIED FOUO

Comments from Defense Information Systems Agency

DEFENSE INFORMATION SYSTEMS AGENCY
701 S. COURT HOUSE ROAD
ARLINGTON, VA 22204-2199

CM

27 AUG 1992

MEMORANDUM FOR INSPECTOR GENERAL, DEPARTMENT OF DEFENSE
ATTN: Director, Readiness and Operational Support Directorate

SUBJECT: Draft Audit Report on Tactical Command, Control, and Communications Interoperability (Project No. 1RA-0048)

Reference: DoDIG Memo, subject as above, 30 Jun 92

As requested by the reference, the Defense Information Systems Agency has reviewed the subject report. Our comments are provided at the enclosure. Should you have questions regarding our response, contact Ms. Sandi Leicht on 692-2172.

FOR THE DIRECTOR:

1 Enclosure a/s

GEORGE J. HOFFMAN
Comptroller

DISA COMMENTS ON DRAFT AUDIT REPORT ON
TACTICAL COMMAND, CONTROL, AND COMMUNICATIONS
INTEROPERABILITY (PROJECT NO. 1RA-0048)

1. Finding C, Interoperability Test Initiatives: Concur In Part. This finding states that the Joint Interoperability Test Center (JITC) cannot test U.S. tactical C3 systems capabilities with command and control systems of NATO member nations and that JITC has not established a C3 testbed link between the U.S. joint C3 test facility at Fort Huachuca, AZ, and the NATO Supreme Headquarters, Allied Powers, Europe (SHAPE), Technical Center. The JITC, matrixed through the Joint Interoperability and Engineering Organization (JIEO), is pursuing joint and combined testing with NATO and its member nations.

2. Recommendation 1.a.: Concur In Part. This recommendation directs the Director, JIEO, negotiate a Memorandum of Agreement (MOA) between JITC and SHAPE to establish a testbed link. While we agree that a link could be established, this action should take place through the Allied Data Systems Interoperability Agency (ADSIA) and/or the Tri-Services Group for Communications/Electronics (TSGCE).

3. Recommendations 1.b. and 2.: Concur In Part. Recommendation 1.b. directs the Director, JIEO, establish a test link between JITC and SHAPE and recommendation 2 directs the Commander in Chief, U.S. European Command use the Joint Portable Tactical Digital Information Link (TADIL) Tester in future EUCOM exercises. While we agree with these recommendations, a clear set of testing requirements needs to be defined. The requirement for establishing such a link must fully justify the expense of such an undertaking.

Discussion:

The JITC has discussed some specific requirements for interoperability testing with NATO and some tests have been scheduled into the Five Year Interoperability Assurance Plan (see attachments 1 and 2). However, few specific test requirements have been defined. Because the expenses involved with connecting the JITC and SHAPE testbeds would be considerable, a clear set of testing requirements should be specified before proceeding. The JITC has limited direct contact with NATO committees and working groups concerned about testing and interoperability of C3I systems. Even so, JITC has provided information and conducted a number of orientations for NATO visitors to JITC and JIEO.

There is a continuing relationship in the TADIL and Message Text Format (MTF) testing arenas with NATO countries. JITC is taking tentative steps to become involved in bilateral conformance and interoperability testing with the UK, Germany and Canada. Further, the JITC will initiate European operational exercise evaluation requirements discussions during a JITC visit to UNCINCEUR and SHAPE in October 1992. During these meetings, JITC will again offer the services of its CINC Support Division and Joint Portable TADIL (JPTT).

Enclosure

DISA COMMENTS ON PROJECT NO: IRA-0048
CONTINUED

The JITC will work with NATO allies through three means:

o Bilateral agreements such as the German Air Defense Ground Environment (GEADGE) Memorandum of Understanding (MOU) and CINCEUR Advanced Tactical Operations Center (ATOC) submissions to the Five Year Interoperability Assurance Plan (attachment 2).

o NATO ADSIA/TSGCE efforts such as the NATO Interoperability Planning Document (NIPD).

o Exercise support and interoperability lessons learned reports for CINCEUR.

All three of these efforts (none of which currently require connection to JITC's Distributed Test Bed) have been ongoing and are expected to result in testing being conducted during FY93.

Currently, the JITC can only test U.S. tactical C3 systems capabilities with the command and control systems of NATO member nations using the JPTT. If a connection is made to JITC's distributed test network, NATO C2I systems could be tested using the Joint Interface Test System (JITS) as well. Additionally, the JITC has the capability to provide interoperability testing for communications interfaces in joint or combined scenarios to support NATO requirements. JITC does possess the organization and personnel to conduct all phases of interoperability testing and evaluation. Specific test equipment to support this testing effort is currently available at the JITC (JPTT, JITS, SATCOM, switches, etc.), at other service/agency locations (SMARTS, MULTOTS, EJSE, etc.) or at other NATO member locations (UK JTIDS Testbed, UK Mobile TADIL Tester, SHAPE Technical Center). The establishment, however, of a test link between NATO and JITC Distributed Test Bed must be based on test requirements. To date, no such requirements have been identified.

Because JITC is at the hub of a large and growing distributed test network, and since the Military Communications Electronics Board (MCEB) has identified JITC as the U.S. representative for allied test efforts, NATO members will realize maximum testing potential by connecting to our testbed. (Attachment 1 describes a meeting with the UK to discuss such a connection.) This connection could be realized in a number of different ways, but must be fiscally justified by identifiable test requirements. The next step is agreeing to do so.

JITC does not currently believe that a MOU with SHAPE is the appropriate vehicle to support these efforts. U.S. test ventures with NATO should be focused through the ADSIA and TSGCE. SHAPE facilities may be required based on specific test requirements identified by ADSIA and TSGCE.

JITC looks forward to continuing to identify interoperability test efforts with NATO allies.

JITC ACTIONS WITHIN NATO

1. WITHIN THE ALLIED DATA SYSTEMS INTEROPERABILITY AGENCY (ADSIA) WE ARE PURSUING AN INTEROPERABILITY EVALUATION PROGRAM. WE PROVIDED A DOCUMENT VERY SIMILAR TO THE 9002. IT INCLUDED THE SPECIFIC TEXT FOR PROCEDURAL INTEROPERABILITY TESTING AND HAD A SECTION FOR TECHNICAL INTEROPERABILITY TO BE PROVIDED BY THE TSGCE. THIS DOCUMENT WENT THROUGH ALLIED NATIONAL STAFFING AND WAS RETURNED TO US THIS SUMMER AS THE NATO INTEROPERABILITY PROGRAM DIRECTIVE VOL FIVE (NIPD VOL 5). IT INCLUDED LITTLE OF THE CERTIFICATION/EVALUATION PROGRAM RECOMMENDED BY THE US, BUT IS A START ON GETTING A PROGRAM INITIATED WITHIN NATO. THE TSGCE REQUESTED JITC TO DRAFT THE TECHNICAL SECTION. THIS WAS PROVIDED TO JIEO TO BE FORWARDED TO TSGCE ON 6 AUG 92.

2. WITHIN THE TRI-SERVICES GROUP FOR COMMUNICATIONS AND ELECTRONICS (TSGCE) AN EFFORT HAS BEEN INITIATED BY THE US DELEGATE TO THE SUBGROUP 9, WORKING GROUP 4 TO EVALUATE THE FEASIBILITY OF CONNECTING NATO TEST BEDS WITH US TEST BEDS. JITC WILL BE ATTENDING A MEETING OF EXPERTS IN MALVERN, UK ON 25-26 AUG 92 TO ADDRESS THIS ISSUE.

3. BILATERAL:

A. A US-GERMAN MOU IS IN PLACE FOR EVALUATION OF INTEROPERABILITY OF THE GERMAN AIR DEFENSE GROUND ENVIRONMENT (GEADGE) TO TSQ-73 TADIL B INTERFACE. JITC HAD BEEN ATTENDING WORKING GROUP MEETINGS DEFINING THE TEST PROCESS AND HAD GOTTEN TO THE POINT OF DISCUSSING THE BASIC TEST PLAN. THIS EFFORT WAS PUT ON HOLD FOR 18 MONTHS WHILE THE JOINT STAFF AND OSD REVIEWED THE MOU FOR REVISION. FINAL RESOLUTION WAS JUST RECEIVED WHICH STATES THAT NO REVISION IS REQUIRED AND THE JIEO (JITC) IS TO CONTINUE ITS EFFORTS TO CONDUCT AN INTEROPERABILITY EVALUATION. EFFORTS HAVE BEEN REINITIATED. JITC IS WAITING FOR A REPLY FROM THE US LEAD ON THE MOU (USAFE) ON THE STATUS OF THIS EFFORT.

B. GREAT BRITAIN INDICATED THAT IT WAS INTERESTED IN A BILATERAL WITH US TO EVALUATE INTEROPERABILITY BETWEEN US AND UK SYSTEMS ON THE TADIL A INTERFACE. EFFORTS STARTED WELL OVER A YEAR AGO CONCERNING COOPERATIVE EFFORTS BUT STOPPED WHEN THE UK LOST THEIR FUNDING. UK HAS AGAIN FOUND FUNDING AND VISITED JITC THE FIRST WEEK OF APRIL. ANOTHER VISIT BY UK PERSONNEL IS SCHEDULED FOR EARLY SEPTEMBER.

Attachment (1)

Tests Involving NATO Member Nations
Listed in JIEO Plan 3100, Five Year Interoperability
Assurance Plan, 14 Jan 92

Technical Tests:

88-EUR-T001	Allied Tactical Operations Center (ATOC) Date: TBD
89-ARM-T003	AN/TTC-39A Interface with European Telephone System (ETS) Date: TBD
89-ARM-T00[illegible]	AN/TTC-39A Interface with Dutch Bundesport (DBP) Date: 4Q FY92
88-DCA-T016	Interface between MSE network and DSCS/GMF/UK SATCOM Terminals Date: TBD

Procedural Tests:

88-EUR-P001	TSQ-73/GEADGE-NADGE Interoperability Evaluation Test Date: TBD
89-AFR-P001	Iceland Air Defense System (IADS) Date: 3Q FY93

Strategic Tests:

92-DCA-S020	DCS (DSN) to NATO Secure Voice Interface Date: TBD
92-DCA-S021	DSCS to NATO Satellite Interface Date: FY94
92-DCA-S022	DSCS to NATO Terrestrial Interface Date: FY94

Attachment (2)

AUDIT TEAM MEMBERS

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